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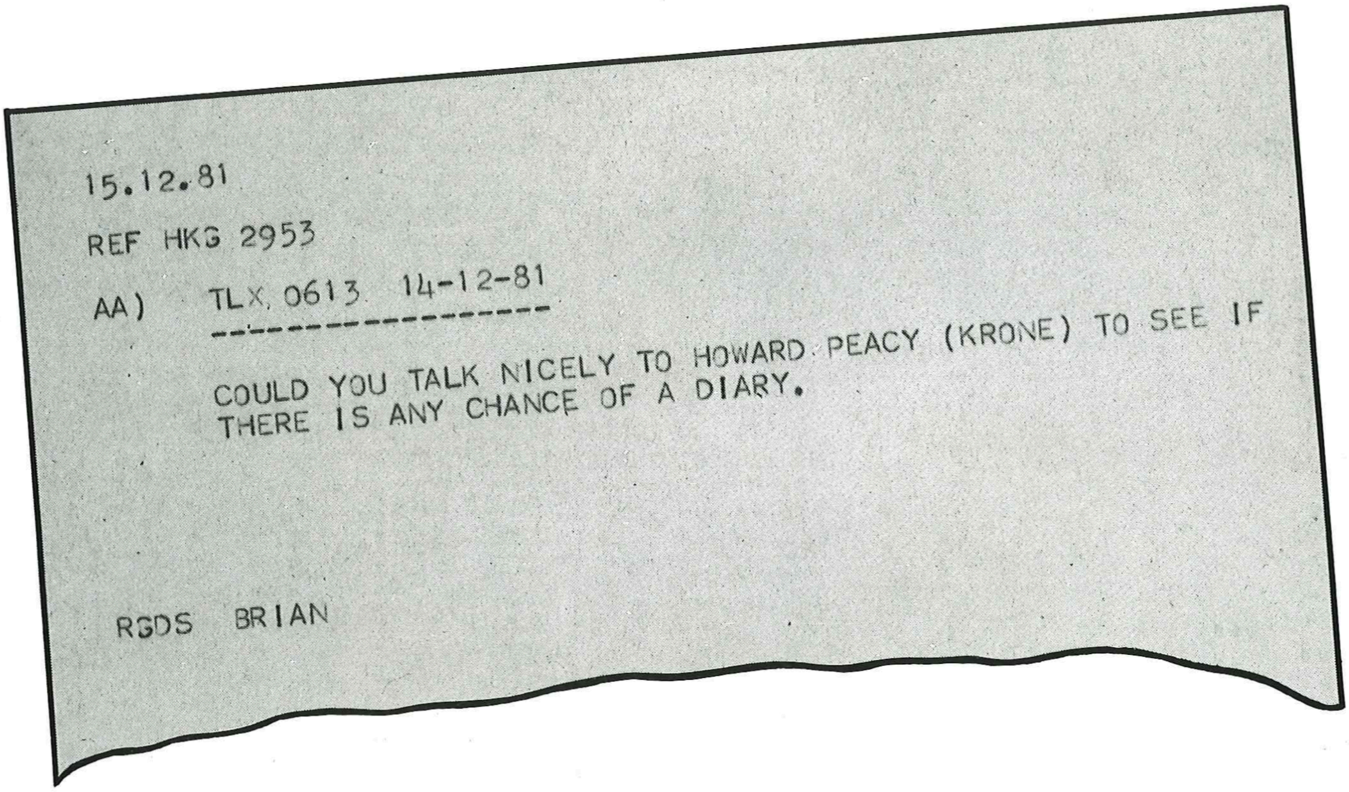
British TELECOM Journal

Winter 1981/82 Volume 2 Number 4 Price 30p

KRONE

Obviously, the word has got around.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COULD YOU TALK NICELY TO HOWARD PEACY (KRONE) TO SEE IF THERE IS ANY CHANCE OF A DIARY.

RGDS BRIAN

The people of Krone pride themselves on being as helpful as they can, whatever their customers' problems. That's why they get telexes like this one. Its author, after all, could have got hold of a dairy from anybody. But the Krone people like to think he came to them because they take the trouble to come up with the right answers. Whether it's a major technical matter, or something as minor as a complimentary diary.

Still, they realise they're not quite perfect yet. After all, he did have to ask!

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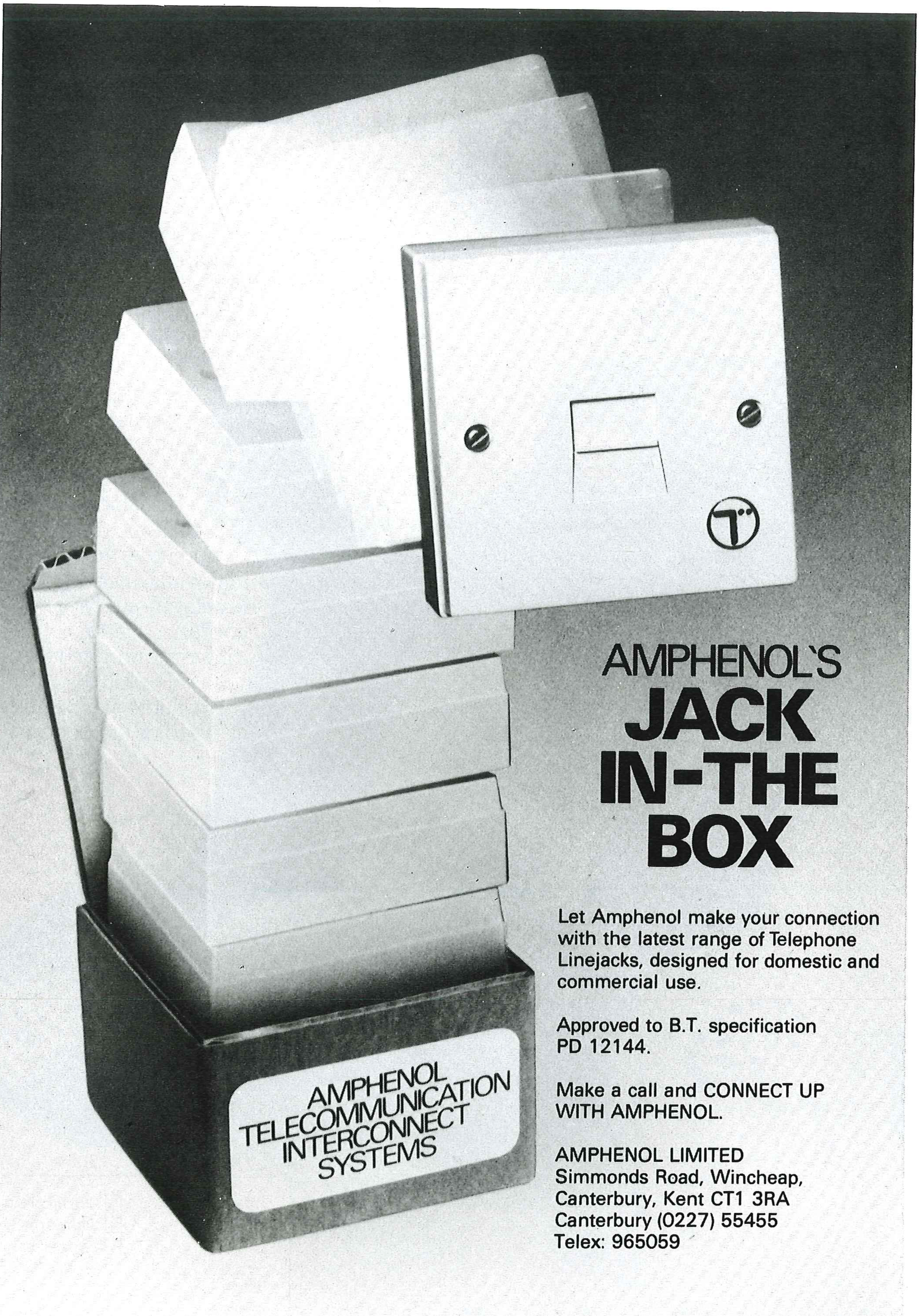
Technology with a smile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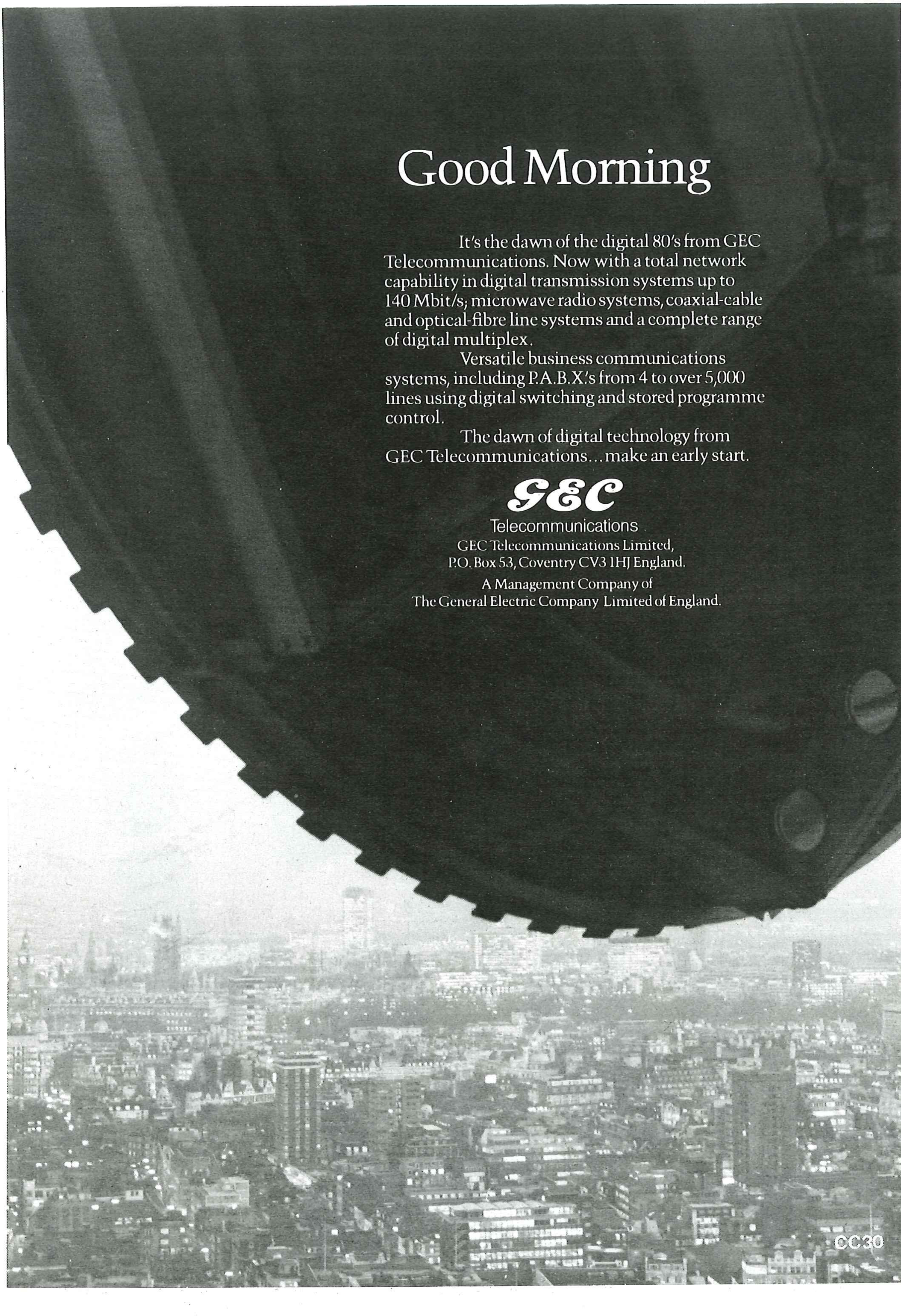
Good Morning
It's the dawn of the digital 80's from GEC Telecommunications. Now with a total network capability in digital transmission systems up to 140 Mbit/s; microwave radio systems, coaxial-cable and optical-fibre line systems and a complete range of digital multiplex.
Versatile business communications systems, including P.A.B.X.'s from 4 to over 5,000 lines using digital switching and stored programme control.
The dawn of digital technology from GEC Telecommunications... make an early start.
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SOCKETS
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It doesn't matter whether you have transistor packages, chip carriers, flat-pack IC's, axial lead components or power transistors. We stock an incredible range of TEXTOOL sockets, each designed to accept your device for test, burn-in, breadboarding or any other purpose.
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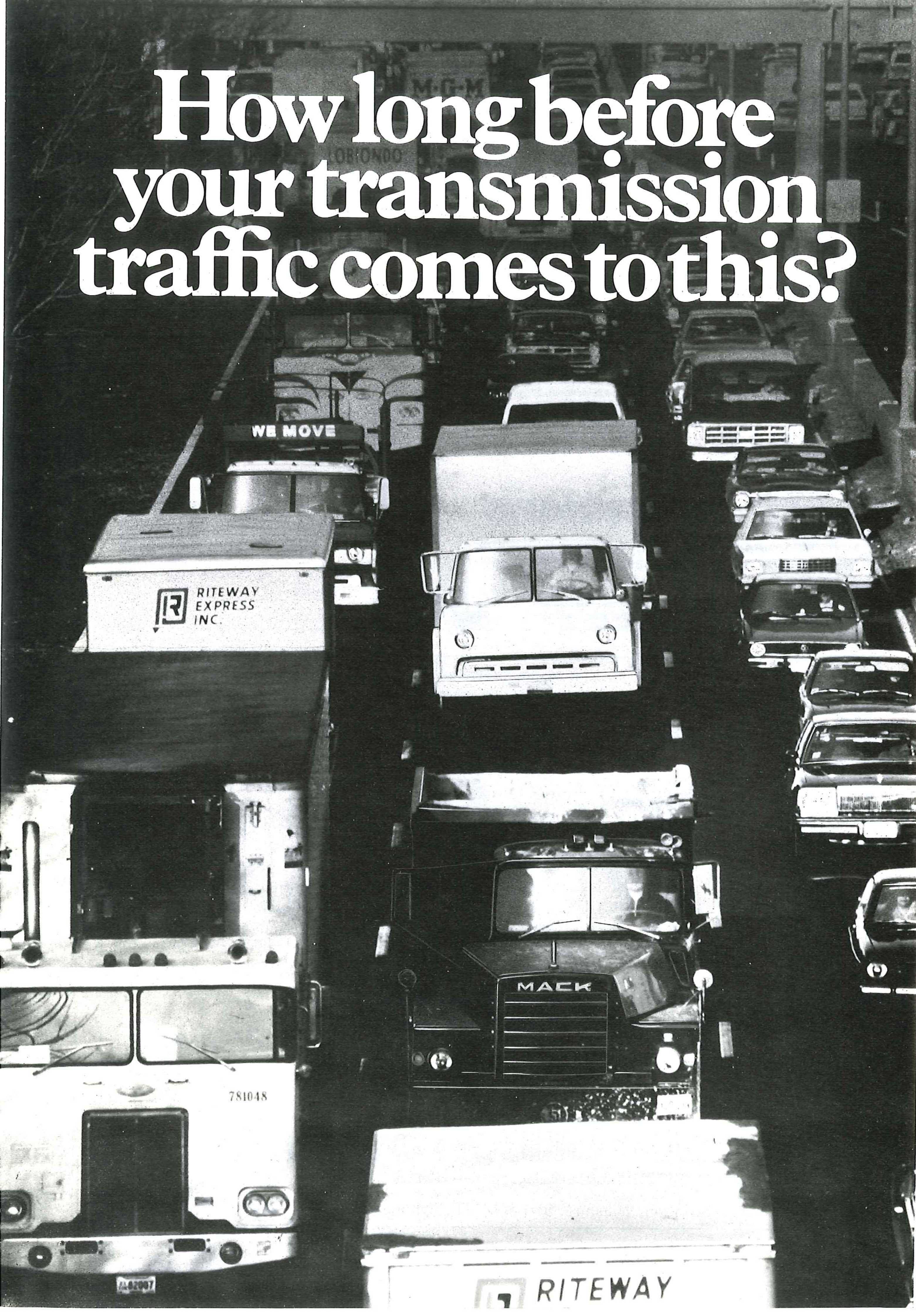
How long before your transmission traffic comes to this?



Traffic jams don't happen only on roads. They can happen, all too easily, in communications.

Are your transmission networks ready and able to accommodate the ever-growing demand for a mixture of traffic—more telephones, TV, telex, facsimile, data, videotex?

How, and when, do you make the move from analogue to digital, as move you must?

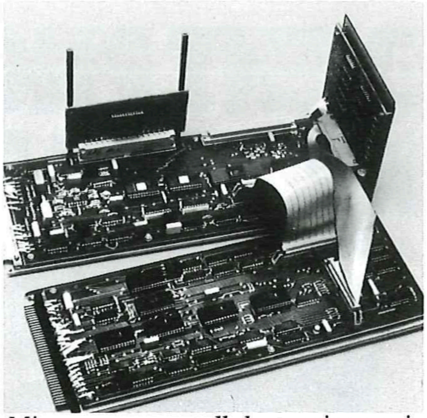
Interfacing with the future

STC can help you, more than most, interface with the communications future.

For one thing, STC has a close family of telecommunications products and services. So transmission systems benefit from STC experience in electronic switching, network planning, project management and research and development.

For another, STC has a particularly wide range of line systems, from analogue through digital to optical.

What is more, because Britain has made its commitment to the move from analogue to digital systems sooner than most other countries, we



Microprocessor controlled supervisory unit

have a special advantage in our experience of making the transition a smooth one.

Technology plus

However, STC has more to offer than advanced transmission technology.

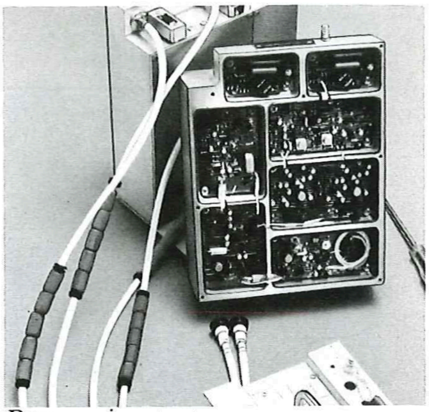
Added to British Telecom experience is the fact that a significant part of our business is export business.

We provide training programmes designed specifically to meet our customers' individual needs. In addition to theory, our practical training acclimatises engineers to their new equipment.

We've proved our equipment (and ourselves) adaptable, not only in working with present and future systems, but also with people.

PTT Administrations worldwide tell us that they have enjoyed our involvement from the planning and development stage, right through to commissioning and operation in their own national networks.

Quite simply, some of our best friends are our customers.



Regenerative repeater

For more detailed information on how STC can help you satisfy the increasing demand, complete the coupon or attach it to your letterhead.

This advertisement is one in a series presenting STC's wide-ranging capabilities in telecommunications and electronics.

To STC, Dept. 810,
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Please send more information about STC's leadership in transmission systems.

- ☐ Analogue systems
- ☐ Digital systems
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Company ______________________

____

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Standard Telephones and Cables plc

STC. We help people communicate.

For a company with a Telex bill over £15,000. The message is clear.

You don't have to be a big user of telex to be able to cut your costs and improve your communications with a TELEX MANAGER.

With prices from £8,500 it will pay for itself quicker than you dared to hope.

This is a new concept in telex.

It means telexes can be sent and received anywhere in your organisation. Between departments. Or long distance. And all without any paper tape to jam or tear or get mixed up. It is so easy to use that no one need be frightened of sending a telex.

Telex messages are created at quiet, good looking display terminals with easy-to-read characters—a well known Ferranti feature. Text editing facilities make it easy to get the messages correct, and you can lay them out clearly so that they're easily understood.

You don't need to know how to send a telex and you needn't keep dialling busy lines. TELEX MANAGER looks after all that and makes the call as short as possible to save you costs, sorts out priorities—sends the most urgent messages first. It will send the same telex to many different places on one word from you.

As for incoming messages, they are accepted without interrupting the operation of the terminal, and can be sent straight to the department that wants them.

TELEX MANAGER is great for a busy telex system and can grow to offer all its advanced facilities to meet larger message switching applications.

Check your telex bill now and you'll get the message.

TELEX MANAGER
A new concept in telex

Please show me how I can cut the cost of telex with TELEX MANAGER

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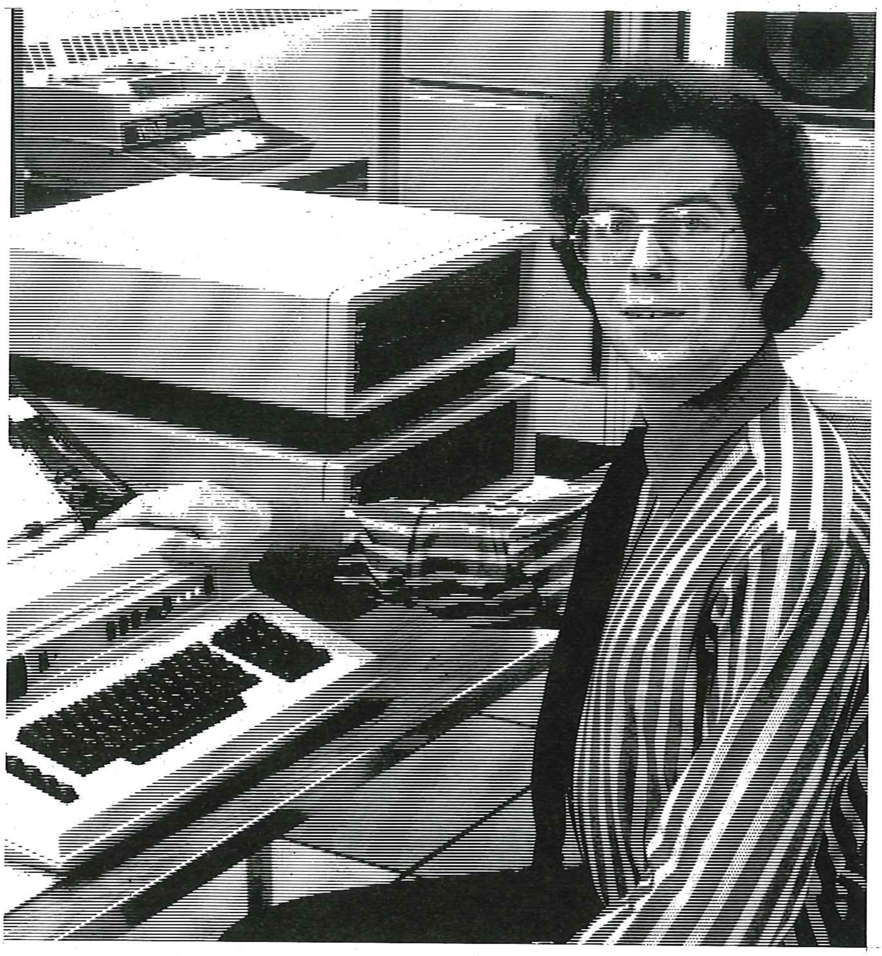

Who needs 16000 perfect bits a second?

The people who are handling the endless flow of information from Britain's computers do. That's if they want to communicate more effectively, and at a lower cost.

To banking, insurance and a host of other vital business services, the new Plessey 16002 modem brings a major advance. It enables digital data to flow at 16000 'bits' of information every second, over telephone lines.

This exceptional speed – possible not just for data but for digital speech, too – will result in far more efficient telephone channel use. It can add up to a substantial saving in transmission costs.

With this British breakthrough in business technology, Plessey is achieving international sales. Right now, to people who need it.

One of a series of advertisements for the general public about the achievements of the British telecommunications industry.

PLESSEY
telecommunications & office systems
Ahead in business communications

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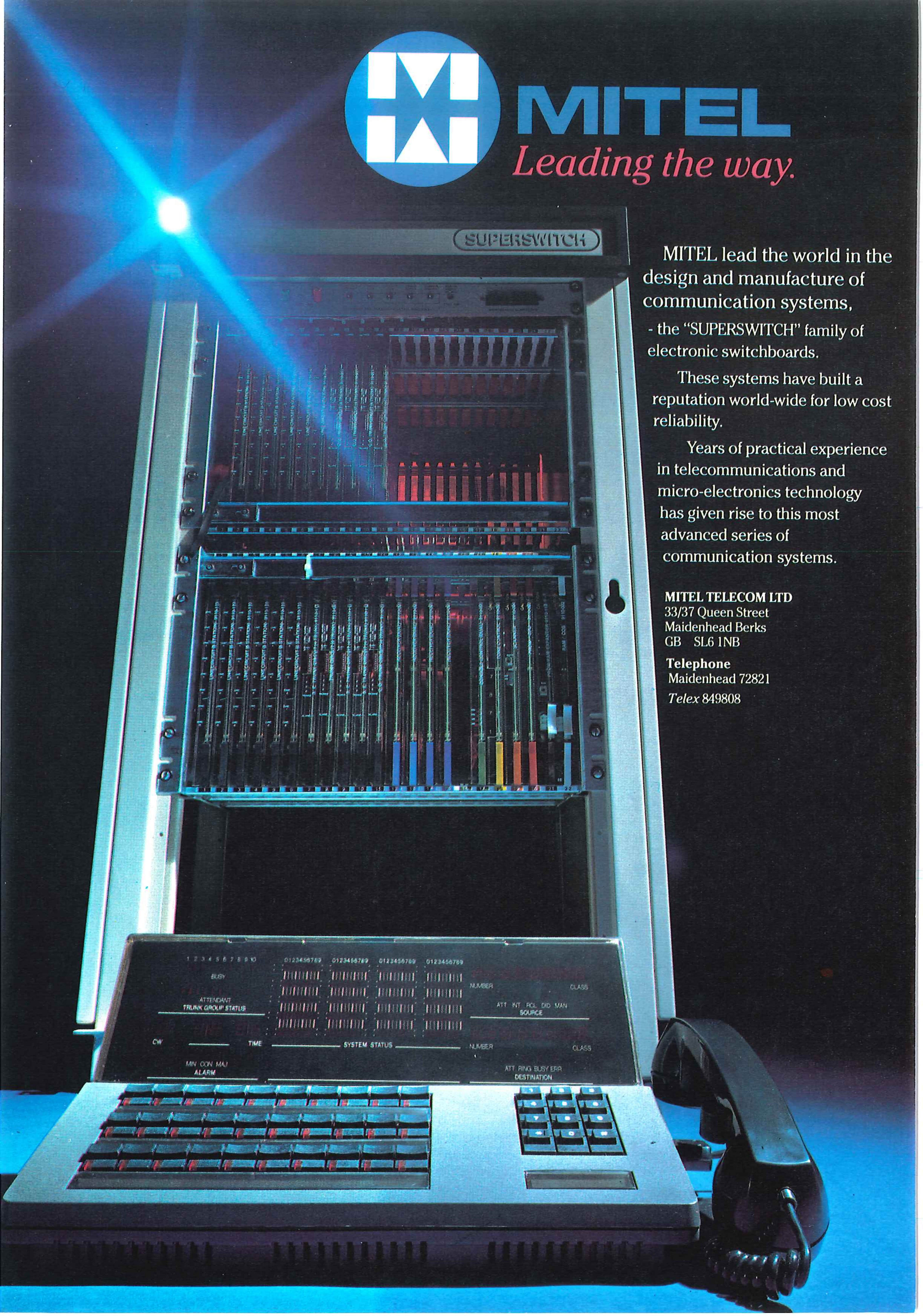
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Leading the way.
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MITEL lead the world in the design and manufacture of communication systems,
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These systems have built a reputation world-wide for low cost reliability.
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CW
TIME
SYSTEM STATUS
ALARM
DESTINATION

British Telecom Journal

Winter 1981/82 Volume 2 Number 4

Published by British Telecom to promote and extend knowledge of the operation and management of telecommunications.

Cover: Despite the worst weather conditions for years, British Telecom engineers continue to maintain communication links. Here Stuart Burgess and Ian Johnston (right) fight their way through Arctic conditions to reach the highest radio station in the United Kingdom, 2,500 feet up a mountain in Dumfries-shire in Scotland.

Extracting the digit

In today's high technology world, any thrusting, competitive business can only operate successfully with a flexible, secure, economical and speedily provided and maintained communications service. To this end, a significant milestone was reached in January with the announcement by British Telecom that more than 100,000 miles of advanced digital systems have already been installed and now play a vital part in the nation's telecommunications network. Put another way, this means that more than 8,000 digital transmission links are currently in service and that, on average, eight new links are coming into use every working day.

These facts were revealed by British Telecom Chairman Sir George Jefferson at a press conference to launch the Corporation's new family of digital communication services known as X-Stream. At the same time, it was announced that an agreement had been reached between British Telecom and a United States company, Satellite Business Systems (SBS) which gives UK customers access to the SBS network while at the same time enabling American users to link up with the digital services now being introduced in this country. Both British Telecom and SBS plan to offer a wide range of new services including video teleconferencing, and electronic mail.

The four X-Stream services – MegaStream, KiloStream, SwitchStream and SatStream – are all aimed at different segments of the business community and all share the advantages of digital communications – lower costs, higher transmission speeds, better speech or picture quality, more flexibility and greater compatibility with other international systems. Already, about 30 orders worth some £750,000 a year in rental alone have been received from business customers.

MegaStream and KiloStream are digital private circuits giving direct links between two or more points and leased to customers for their own exclusive use.

Both services can be extended internationally. A basic version of MegaStream – a broadband service transmitting at 2 or 8 million bits a second – is already working on the London overlay network while KiloStream, which offers single channel access to digital services at 2.4, 4.8, 9.6, 48 and 64 thousand bits a second will become available by the end of the year.

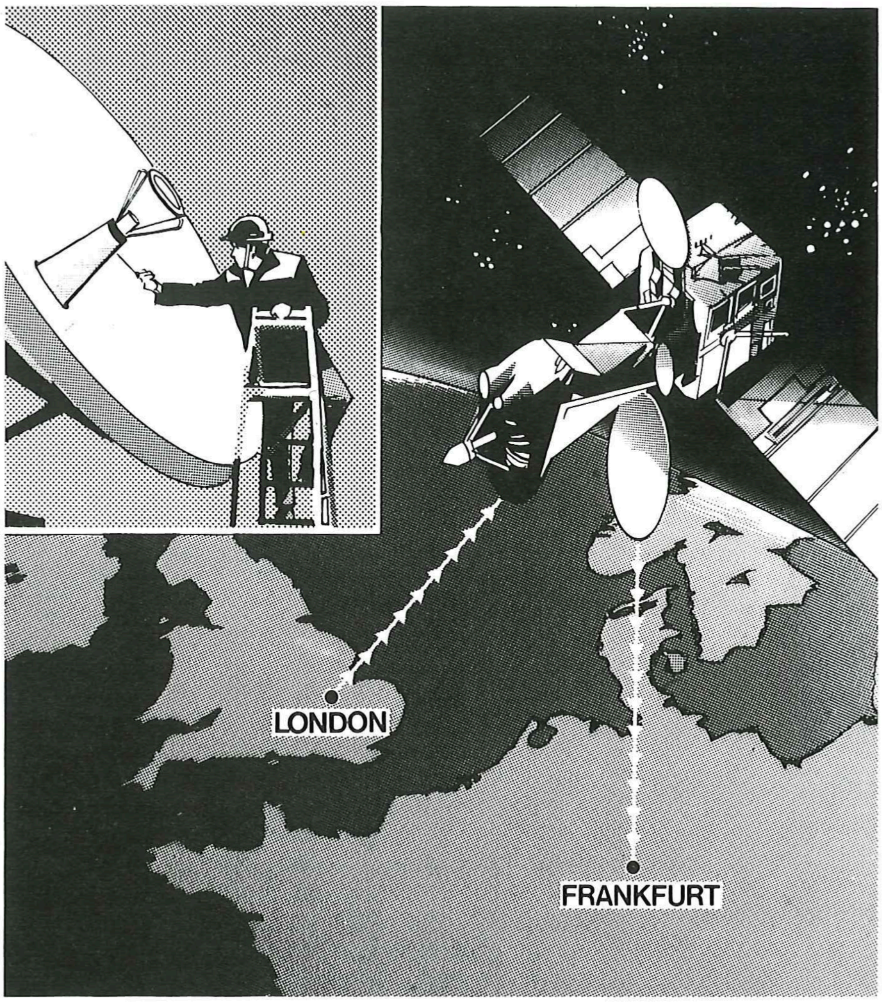
The first of two versions of SwitchStream, a switched digital service which provides a simple transmission medium between a wide variety of data installations, is already working and is known as the packet switched data service (PSS). This can now be linked internationally. SatStream recently made the headlines when British Telecom and the *Financial Times* completed a successful demonstration of one of its applications (See page 2).

As Sir George Jefferson stated, digital services are no elusive promise. They are here now and provide solid answers to those critics who complain that British Telecom is still not responsive to market needs. The good news from Sir George underlines the fact that British Telecom really does mean business and is fully equal to the challenge of digital development both nationally and internationally.

Rooftop aerials make headlines

M Kirsch

Small rooftop aerials capable of receiving data and facsimile as well as telephone calls via satellites 23,000 miles out into space are currently being tested by British Telecom International who hope to establish a regular service – SatStream – between the UK and Europe by early 1984.



The path of a digitised stream of information from the Financial Times headquarters in London to its offices in Frankfurt.
Inset: Impression of a rooftop SatStream aerial in position.

The first customer trials using satellite transmission and small dish earth stations based at or near a customer's premises began in November with the installation of a three-metre dish aerial and its associated electronic equipment on the roof of the Financial Times building in the City of London. During the following fortnight, the aerial was used to demonstrate the flexibility and capabilities offered by small dish satellite transmission.

The trial aerial can beam digitised printing information from the *Financial Times* roof to the experimental European orbital test satellite and then on to another dish aerial at the *Financial Times* printers in Frankfurt. As part of the demonstration, some of the data was used to print a special supplement to the *Financial Times* which was of particular interest to newspapers in Europe and in the United States.

SatStream is part of a whole new set of digital communication services made possible by the new technology which will be gradually introduced in Britain during the 1980s. Users will be well protected from the communications logjams which are today the bane of national and international business.

When in commercial use, SatStream will enable newspapers to publish simultaneously in cities all over western Europe, although with the *Financial Times* printing simultaneously in London and Frankfurt, the *Guardian* in London and Manchester, and the *International Herald Tribune* in Paris, London Zurich and Hong Kong, this is not a new concept. Using facsimile machines, these newspapers have been sending their printing data at a rather slow rate over landlines, so that a whole edition of the *Financial Times* has been taking some three hours to transmit.

SatStream has several advantages over the current system. It transmits printing instructions nearly 30 times more quickly than is possible today over the commercial network, and with a very low error rate. The satellites to be used commercially will allow newspaper pages to be beamed down to a number of cities many hundreds of miles apart without taking up additional capacity in the satellites.

Eavesdropping will be virtually impossible, and transmission can be made fully secure by adopting a method known as encryption which turns streams of digital information into a code which cannot be broken. Even without encryption, privacy is largely guaranteed by the use of time-division multiple access (TDMA) between SatStream terminals. This prevents one station extracting data addressed to another. Crypto-encoding

One of the four daily editorial conferences at the Financial Times. Highlighted in a new film, 'A 24-hour day', the conferences help to co-ordinate the newsgathering, production and distribution processes necessary to deliver the finished product to more than 140 countries. SatStream will help speed the production.

The small dish aerial is carefully positioned on the roof of Bracken House, the Financial Times HQ, by British Telecom engineers and technicians.

also adds to the security of the system.

SatStream will make all the recent advances in information technology – electronic mail, videotex, electronic funds transfer, high-speed facsimile, video and audio conferencing – easier, quicker and more effective to use and will allow UK businessmen to compete more effectively in world markets.

The Satstream service is now well beyond the drawing board stage and, following some careful market research, 12 small dish earth terminals are already on order. Certain to be attractive to banks, oil companies and other large organisations, the service will allow companies to engage in new telecommunications techniques requiring digital or high-speed transmission. Companies who now want to be protected from a computer breakdown which might lose vital business records have to send computer tapes by rail or air to their duplicate data centres. With SatStream, they can transmit duplicate databases quickly and economically. The combination of space and digital technologies, including the use of optical fibres and lasers, means Satstream can offer substantial commercial advantages, achieving things which current networks cannot provide.

An important business application of Satstream is called bulk file transfer. Increasing numbers of multinational businesses already use computers to manage their day-to-day activities and keep vital records. They often have to go to much expense keeping up duplicate data centres, so that if one fails, the information is still held in another file. These files need to be kept up to date, but the time taken to transfer records by air or rail has to be measured in hours and days. The fastest rate of information transfer available to business over international leased circuits is 72 kbit/s, which is too slow for the volume of data most big international companies need to keep daily. SatStream will be able to do the job almost 30 times faster at 2,040 kbit/s.

Between now and 1984, SatStream's designers and organisers, together with some of British Telecom International's more forward-looking customers, will be carrying out experiments to resolve the practical problems of providing a service. Where to locate small dish aerials, how to connect them with their electronics using either microwave beams or optical fibres, CCITT-recommended interfacing and protocol standards; all these questions will be investigated.

Channels will be offered, not only on a full-time basis, but also part-time, preassigned or on demand as well. The first earth terminals in the SatStream service will not be cheap, and because of the high frequencies needed for European use, the equipment supporting the terminals has to be sophisticated. But siting should not present problems because the aerials use exclusive frequency bands.

Although SatStream's current experiments use the European orbital test satellite, the service will use channels set aside by Eutelsat in two new satellites – Telecom 1 and ECS.

Business communications in Europe are on the threshold of a bold new era and it may not be long before Europeans accept the benefits of small dish aerials in the same way that international direct dialling is now commonplace.

Mr M. Kirsch is an information officer in the public relations group of British Telecom International.

British Telecom Journal, Winter 1981/82

Meeting the challenge

During the next 18 months, more than 100 new telephone shops will be opened throughout the country. Several are already operating and our pictures show typical scenes at Southampton, Leeds, Taunton and Cardiff.

The launch late last year of British Telecom's three-pronged attack on the marketplace by offering phones for sale, opening more phone shops and introducing plug and socket connections in the home, is clear indication that the Corporation is committed to a major drive to encourage more business and meet the challenge of competition.

Offering phones for sale ends a rental-only policy which began when the public telephone network was established before the first world war. In recent years, a wide range of telephone designs has been developed and customers will now be free to buy or rent the equipment of their choice providing it has British Telecom approval.

Telephones initially offered for sale – in addition to the standard range – will be Plessey's Snoopy, a new addition to the Special Range telephones, GEC's Contempra, and Northern Telecom's Dawn. Most of the Special Range (about a dozen models), will be available by Easter. Prices will be announced as each model comes on the market.

Most new telephones will be sold from the nationwide chain of shops now being

Special Range Telephones which have been approved by British Telecom. They come in a variety of styles, materials and colours.

Special Range Telephones

An engineer fits a surface-mounted socket in a skirting board at a customer's home. Sockets can also be fitted flush with the wall or have side entry.

opened throughout the country. An experimental shop, opened in Debenhams at Taunton, has already proved popular, and has been followed by similar success stories at Southampton, Leeds, Cardiff, Southend and Portsmouth. More than 100 phone shops will have opened by the end of 1983 and the scheme will be extended so that telephones can be bought from sales offices and from travelling caravans. Shoppers will also be able to pay their telephone bills, buy stamps and get information on business systems.

Introduction of the new-style sockets into the home will eventually lead to all British Telecom's existing 28 million telephones being fitted with the new connectors. Plugs and sockets are currently being fitted on all new home extensions, and will make the telephone as mobile as any other electrical appliance. Customers will be able to take telephones from room to room, plugging them in and out as they wish, wherever the phone sockets have been installed. They will also be able to change their phone easily – or take it with them when they move into a new home.

The new plugs will not work with old sockets – neither will the new sockets work with old plugs. The new plugs and sockets are smaller and neater than the old style and were designed by British Telecom, who believe them to be technically superior to and safer than any others in use in other parts of the world, including those in Europe and the USA.

Private suppliers, whose extension phones are approved as suitable to attach to the network, will have equal access to plugs from the companies which supply British Telecom and customers who buy approved private phones can readily have sockets fitted by British Telecom. Installation charges for the new sockets, range from £10 to £25, and are cheaper than some types of extension arrangements available until now. Customers are also being offered a bonus in that when British Telecom engineers fix new extension sockets to a line they will convert existing instruments free.

Accompanying the new plug and socket will be a change to high impedance ringing and to a simplified wiring system. Both are a part of British Telecom's submission to the British Standards Institution for connecting competitively-supplied equipment to the public telephone network. At present, connection of telephones in parallel degrades the quality of a customer's telephone service. Under the new system, up to four phones can be connected in parallel on most lines.

The British Telecommunications Act, which came into force at the end of last year, authorised British Telecom to retain a monopoly over the first telephone in every installation after the market is liberalised. But British Telecom will certainly be competing with private retailers to sell extension telephones.

As Simon Evans, head of the new shops, has said: "Telephones are no longer a lifetime purchase: They are now a fashion addition to the home".

British Telecom Journal, Winter 1981/82

Cause for alarms

M A Ward

The present era of rising crime, high insurance premiums and widespread use of expensive machinery requiring control and surveillance, has led to a massive increase in the use of alarm services. This has put considerable pressure on British Telecom as supplier of the communications network in the UK, as well as various emergency services which have to respond to the many calls generated by these alarm services.

The factors influencing the growth of alarm services in the UK basically fall into three categories – crime, fire and welfare. As for the first, the crime rate in the UK has been increasing rapidly over the past decade and burglaries, now running at over 600,000 a year, have reached epidemic proportions. This has led to many private alarm systems, some of doubtful quality, and resulted in a false alarm rate of no less than 98 per cent. In London alone, 166,153 false alarms were received in 1978 costing about £8 million in wasted time. The more stringent security in the commercial sector has resulted in more burglaries in the private sector, with 52 per cent of insurance claims in 1979/80 amounting to a £49 million a year payout for household cases.

During 1979/80, more than £400 million was paid out by insurance companies for fire damage – enough, for example, to build several hospitals. Inevitably, this is another area where there has been a substantial influx of alarm systems, but again it has brought with it a similar proportion of false alarms, at a ratio of some 11 to one.

And although perhaps not an obvious area of growth, a number of factors have resulted in the welfare services becoming an important area for alarms. With increased welfare services and medical care, the proportion of the population over 65 will increase by about six per cent in the next decade, while those over 75 will increase by 24 per cent. This, together with recent cut-backs in social services budgets resulting in less 'sheltered'-type housing being available, means that a substantial number of elderly people will be living alone and be in need of some supervision. These factors also apply to a lesser degree to the sick and those who suffer from some degree of handicap.

So what exactly is British Telecom's role in providing reliable services designed to fulfil the needs generated in the above areas? For obvious reasons, the approach has been to provide an alarm system, which utilises the existing benefits of the public switched telephone network (PSTN). Known as the 'abc' alarms transmission system, it is presently being operated by British Telecom on a limited scale in East Anglia. It transmits alarm information over the existing local telephone lines at a frequency above the speech band thus allowing independent and simultaneous use of the alarm system and telephone.

The basic alarm system is shown in the

At the first sign of trouble a cashier presses her 'alarms by carrier' button which uses ordinary telephone lines to alert the police.

The abc network outline

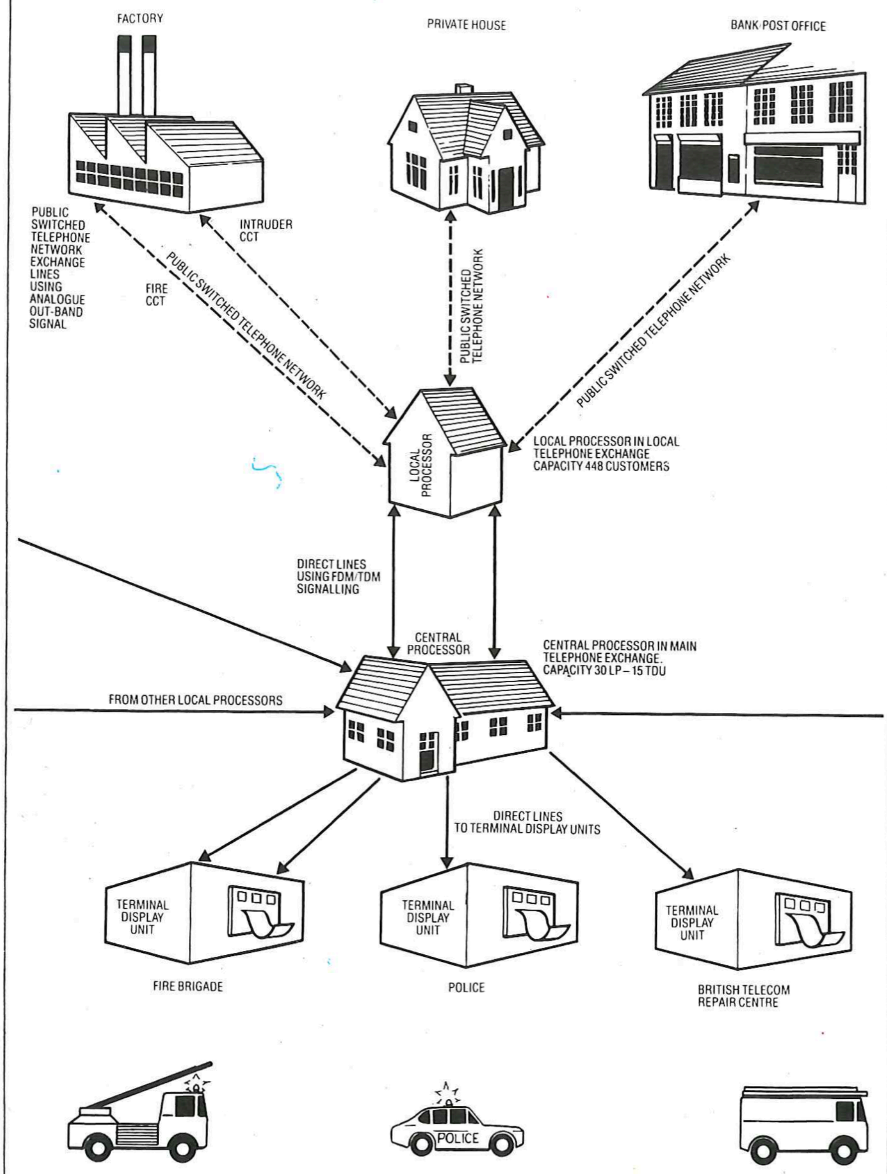


diagram above. Alarms are terminated on a processing unit at the local telephone exchange which concentrates 448 alarms on to secured circuits to a central processor in a 'main' local exchange. The central processor can deal with 30 local processing units and has 15 outlets tc terminal display units situated remotely at the various receiving centres, such as fire and police stations.

An alarm originated at the customer's premises causes a change in the state of the signal which is registered at the local processor unit and transmitted to the central processor together with the coded identity of the customer. The central processor routes the call to the appropriate terminal display unit which prints out the customer's identity, alarm status, message number, time received, destination of call and time acknowledged. The equipment also details faults and transmits details direct to a British Telecom repair centre.

As well as marketing the 'abc' alarm transmission system, British Telecom has also been looking into the possibility of providing more specialised alarm terminal systems. One particular system under development is slow-scan television (SSTV). Normally the use of closed-circuit television (CCTV) for surveillance requires expensive coaxial or poly-quad type cable to transmit the wide bandwidth (1 to 5 MHz, depending on resolution required) needed for moving pictures. Recent developments, at the British Telecom Research Laboratories at Martlesham in the digital storage of television pictures has made another type of closed-circuit television available for transmission over less expensive cable links. This is SSTV or non real-time television (see *British Telecom Journal*, Winter 1980/81).

In this system, a single picture is captured by the transmitter at the camera end and slowly relayed by digital signals to the receiver at the monitor end. There, it is built-up over a number of seconds until a complete picture is presented, after which a new picture then starts to build-up across the old one. This sequence continues, resulting in a succession of pictures being presented on the monitor.

Transmissions of this type can be sent either over the PSTN or over local/ junction private circuits, much more cheaply than an equivalent CCTV type of transmission. The speed at which the picture is changed depends on the type of modem which is used and varies from 54 seconds on a 4.8 kbit/s modem presently available for use over the PSTN, to 5.4 seconds on a 48 kbit/s data circuit. A 64 kbit/s system will be available for use on System X type exchanges in the future giving a picture-refresh time of about four seconds.

In a typical alarm system using SSTV transmission, the system is wired so that either the activation of a proprietary alarm system or of a movement detector will activate an autodialler. The autodialler links the alarmed premises via the PSTN to the monitor station where the television picture is presented to show the cause for the alarm.

But British Telecom is not the only organisation exploring ways of fulfilling market demand for various types of alarm services. At least nine western European countries are actively marketing various types of alarm services within their network. These range from a scheme to connect all the banking establishments to a centralised alarm reporting network in Holland, to a service in France for the benefit of elderly people living in isolated conditions or for those unfortunately suffering from ill-health.

The two countries at present marketing the most interesting and advanced types of alarm services, however, are Sweden and Switzerland. In Sweden the telecommunications administration (Televerket) provides alarm services to its customers via Televerket Larm and SOS AB. Televerket Larm, a division of Televerket, was formed to draw together the various alarm systems that Televerket had been providing since the 1950s when alarm transmission systems for the fire brigades were first installed.

At present, Televerket Larm market dedicated alarm systems such as burglar and fire detection equipment and closed-circuit television designed for use at the

customer's premises and also systems for the transmission of these alarms between the customer's premises and the alarm centres. Leading system for the latter type of product known as Multicom 2000, is microprocessor controlled and operates within the telecommunications network. It is designed around three basic units – alarm transmitter, regional processor and central processor.

Alarm transmitters are connected at the customer's premises and on activation, communicate with the regional processor which relays the information it receives to the central processor. This then refers to its databanks and routes the call to the correct reception point whether it be police, alarm centre, or pocket pager. It can also distribute commands back to the remote installation via the regional processor.

The alarm network strategy is for the installation of central processors in the 20 alarm offices throughout Sweden with regional processors situated in more than 1,000 telephone exchanges covering each county. These county-based networks will be linked together to give a nationwide alarm communications network.

SOS AB, the other involvement of Televerket in the alarm field, was formed at the start of the 1970s by Televerket, the Swedish Association of Local Councils and the Federation of Swedish County Councils. Its objective was to coordinate and plan public alarm services. At present, it provides, among other things, a telephone emergency service which receives and relays calls to the appropriate authority; an ambulance service which despatches ambulances and liaises with hospitals for admittances; a mountain resource service which controls call-out of rescue teams and their coordination, and a poison information service which administers a poisons and toxic materials directory. In all, SOS AB deals with about four million calls a year, and serves as centre for Televerket Larm alarms.

Until recently, the Swiss PTT provided a '999'-type service using the code '11' via its operators. This was abandoned, however, because the administration could no longer accept responsibility for its operators directing the distributing alarm calls to the correct authority. Currently, emergency calls to fire, police and ambulance services are made via the universal short dialling codes 118, 117 and 114 respectively.

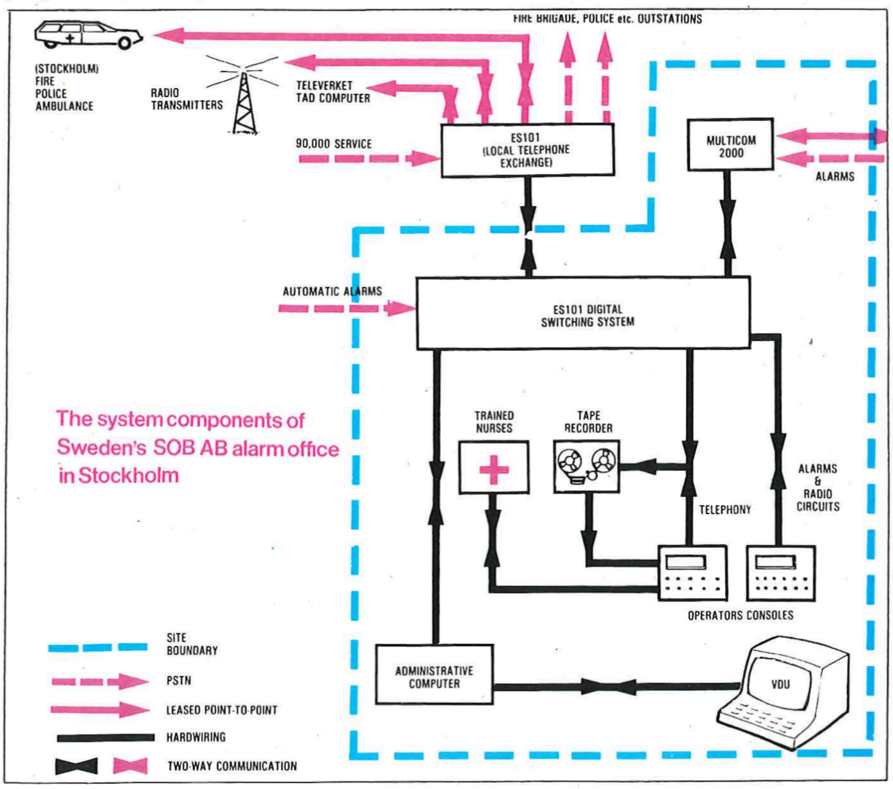
But the Swiss administration has a unique attitude towards the provision of alarm services within its network. To meet heavy demand for alarm transmission systems, it commissioned a manufacturer, Autophon AG, to develop systems which are supplied to the major alarm companies who can, in turn, sublet connections to smaller private companies or individuals. In this way the administration does not have to market the systems.

The systems – known as TUS and SMT – perform separate but complementary roles. The TUS system is a microprocessor-controlled audio-frequency alarm transmission system operating over the local telephone line above the speech band. It is used mainly for transmission of alarm messages through the public telephone network, both switched and unswitched, and the system structure is similar to those already described. The system is fully self-monitoring, including supervision of the transmission paths, and any faults are indicated by direct read-out at visual display terminals.

The SMT system is also microprocessor controlled and alerts designated individuals in the event of accidents, fires, crimes and rescues. Large crews or individuals can be called out, via their telephone, in seconds. A command centre is linked to the main centre by a data and speech channel and all instructions and alarms are originated from it.

The main centre is equipped with a processor and a data store and is responsible for checking and controlling the data communication within the system. The unit is linked by permanent two-wire connection to sub-centres in a local telephone exchange and receive commands from the main centre by a data/speech channel. The sub-centre consists of a number of subscribers' connection units, the subscribers' lines being disconnected from the public telephone network in the event of a mobilisation call. In this way the system is independent of any telephone traffic on the PSTN. The most modern of these systems are of a modular design enabling both to operate through certain common equipment.

So what of the future? One of the undeniable facts about alarm services, telecommunications and the community, is the way in which they are all interrelated. The community generates the need for specific alarm services which are provided by the alarm companies while telecommunications administrations have the networks to communicate the alarm information to the relevant services. It is safe to assume that demand for alarm services will increase and it is important therefore that a strategy is evolved in the UK to deal with the situation. The Swedes and the Swiss are both tackling the problem in different ways and it is significant that many western European administrations are now considering dedicated systems.



The system components of Sweden's SOB AB alarm office in Stockholm

Mr M. A. Ward is a technician in Canterbury Telephone Area. He won a Sir William Ryland Award in 1980 and used it to investigate alarm services and their relationship with telecommunications both at home and abroad.

Success story!

The growth of British Telecom's External Student Scheme since 1977 has been phenomenal. Here, J A H Weller, head of the technical education policy group, looks at the wide range of facilities currently available and outlines future developments.

The external student scheme has developed quickly from its inception four years ago. Then it provided just 91 learning packages but now for the year 1981/82, that total has risen to more than 6,000. Aimed at adult technicians employed by British Telecom, the scheme is meeting a rising demand from those who cannot regularly attend technical college because of working or domestic circumstances.

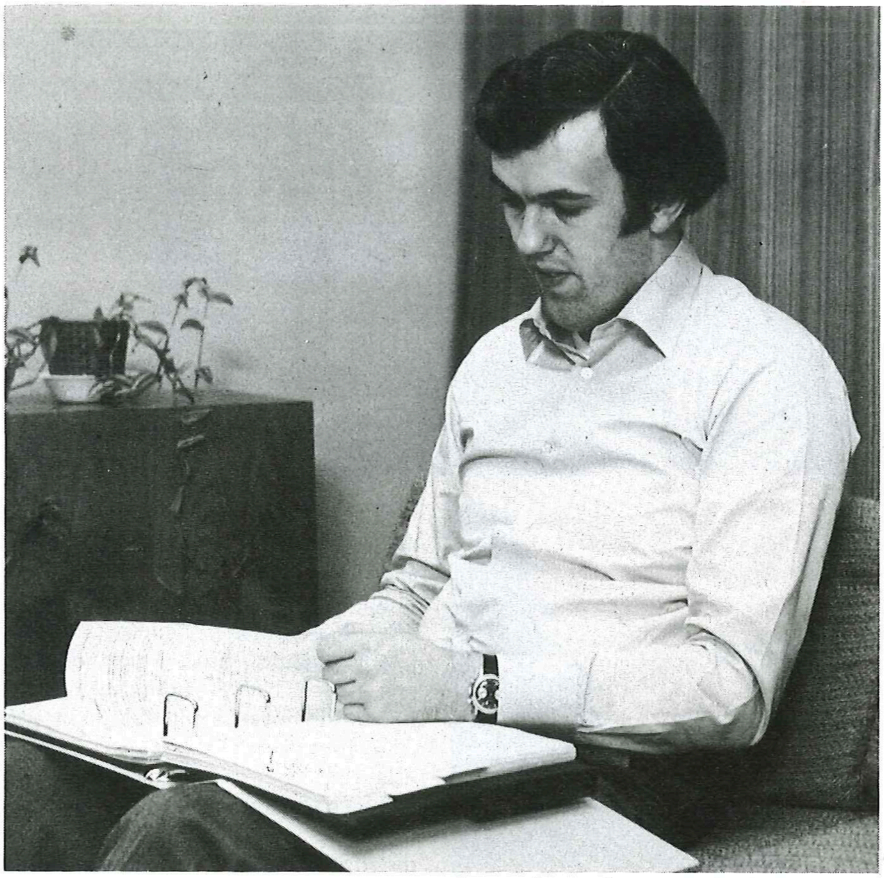
After enrolment, the student chooses one or two learning packages from a nominated tutor based at a college belonging to the scheme. If the nearest college is too far away, then a British Telecom tutor is employed to guide the student through the course.

The learning package concept was developed during 1976 and 1977 following the creation of the Technician Education Council (TEC) and the Scottish Technical Education Council (SCOTEC) in 1973. The scheme has replaced the correspondence courses which have been provided by the Post Office for many years and have enabled tens of thousands of students to sit the City and Guilds of London Institute examinations in a wide range of telecommunications subjects. The opportunity of a fresh start was taken to solve the problem of isolated students studying at home and not regularly meeting a college lecturer or class mates.

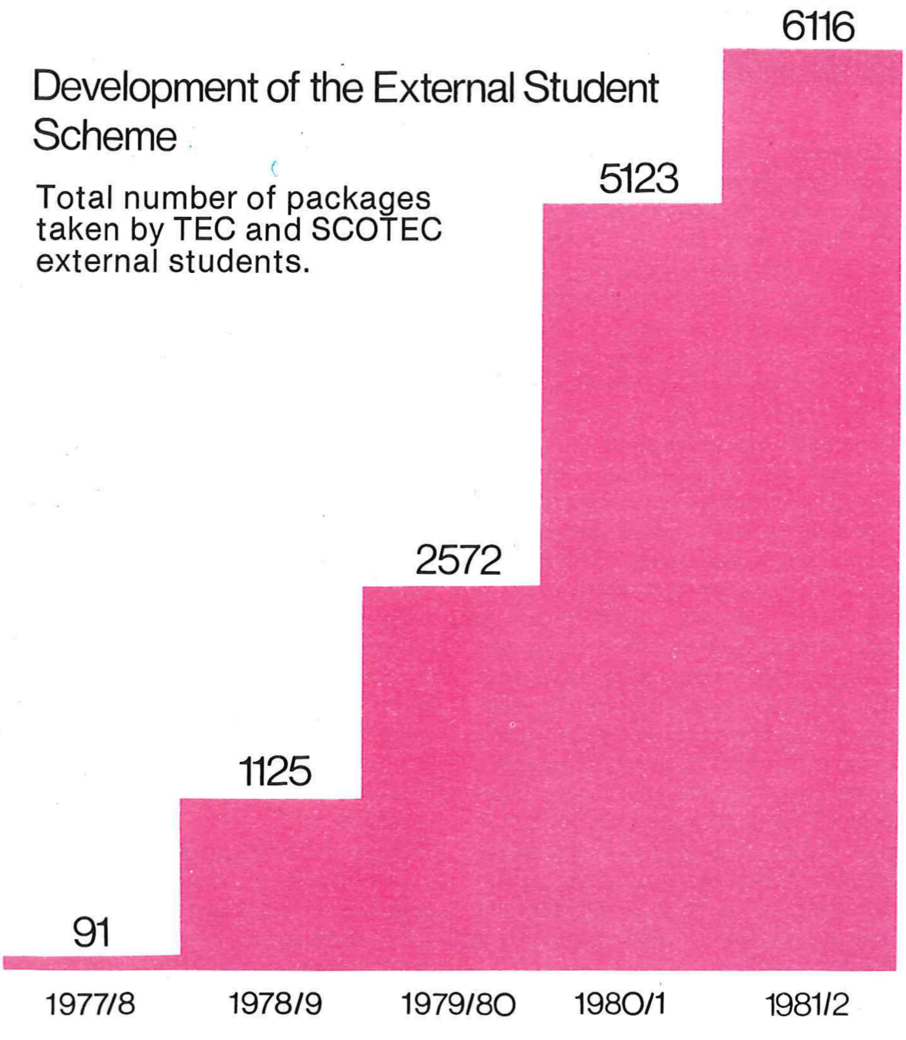
The first learning package was developed by a course team set up in 1976 whose members were drawn from the Open University, technical college lecturers, the Council for Educational Technology as well as from the Post Office. The result was a model of a complete packaged learning course from which all subsequent learning packages followed. Each package provides hourly reading periods known as segments alternating with time devoted to feedback in the form of self-assessed questions attempted by the student at home. A learning package is based on a syllabus which has a designed working length of 60 hours.

All the illustrations are professionally prepared as the text is written. Students receive further motivation and feedback through the pattern and timing of homework, tutorials and tests. Once the student has collected the first packet of learning material including homework questions from the tutor, the next stage is to work through the sequence of segments until the first homework is reached. When completed, the homework is sent for marking by a date set by the tutor who marks it with the help of a structured marking guide. Two weeks later the tutor arranges a group tutorial and discusses all aspects of home-

Mr John Weller, author of this article, conducts a remedial tutorial with a group of technicians studying mathematics.



The success of the external students scheme depends on regular home study. Here a student concentrates on a mathematics package.



work and progress with all the students.

The tutorial provides an invaluable opportunity for students to learn from each other and to obtain feedback from their tutor. Five to 14 days later the student sits an in-course assessment called a phase test, usually invigilated on British Telecom premises. The pattern of study, homework, tutorials and phase tests is repeated at equally-spaced intervals twice more, and at the end of the academic year, the student sits a final examination which covers the whole course. But before the examination time arrives, the student will have had plenty of opportunity to check his or her own progress through the year and correct any difficulties.

It can be seen from the histogram that growth of the scheme has been rapid. The number of packages shown includes both TEC and SCOTEC external students. Packages have been prepared separately for the first years of TEC and SCOTEC but the two streams of students study common packages in the second year of the course. With the introduction of Mathematics II, Electrical Principles II and Electronics II in September 1981, 15 learning packages will have been prepared, written, illustrated, edited, printed and distributed for the first two years of the Certificate Programme.

Developments to the scheme are expected to continue at the same rapid pace. The provision of a learning package for Electronics III in 1984 will complete the third and final year of the Certificate Programme in telecommunications.

For the future, British Telecom's Training and Education Policy Division is considering a response to the consultative document recently published by the Manpower Services Commission for open learning. Although it is far too early to say what the outcome will be to the proposals, Open learning has been defined as the removal, as far as possible, of any restrictions currently preventing adults from furthering their education. Not all restrictions can be removed by technical colleges or employers and the proposals are receiving close and careful consideration.

British Telecom's pioneering efforts in this field of adult education have already made a tremendous impact, and the scheme is set to achieve new standards which will be of major benefit not only to the thousands of staff seeking knowledge and possible advancement, but to British Telecom itself by assuring its future in the best possible way.

Far East phone boom

Once just a small fishing village, developed by western settlers and traders and ceded to Britain in 1841, Hong Kong is today a major centre of business activities in the Far East and has one of the most highly-developed telecommunications systems in Asia. Situated on the south-east coast of China, it now comprises about 1,056 square kilometres and has a population of 5.2 million – a density 20 times higher than that of the UK. But 80 per cent of Hong Kong's population live and work in about one-fortieth of the land area!

Hong Kong's first telephone appeared just a year after Alexander Graham Bell had patented his invention. It was made in 1877 by a government clerk solely on the basis of newspaper reports and descriptions! Five years later, a public telephone system was introduced by the Oriental Telephone and Electric Company but despite this promising start, the telephone network grew slowly at first, due in part to strict governmental regulations. In 1925, a public company, the Hong Kong Telephone Company Limited, was formed and received from the Hong Kong Government the sole franchise to operate and develop the telephone system.

Growth, however, was severely hampered during the Second World War, with much equipment falling into disrepair during the Japanese occupation. It was not until after 1945 that really large-scale expansion got underway. By the late 1960s, growth had become phenomenal at a cumulative rate of 21 per cent a year which peaked at 27 per cent in 1964, at that time the highest in the world.

Currently, Hong Kong's telephone system is growing at more than 10 per cent a year, reflecting the buoyant economy of the small area that has become the world's 18th largest exporting country. With some 1.4 million telephone subscribers (almost two million telephone stations), the system is expected to double in size by the end of the 1980s. At present, more than 90 per cent of all households have a telephone.

Today, the Hong Kong Telephone Company is headed by a ten-man board representing some 25,000 shareholders, 80 per cent of whom own 1,000 shares or less. The Company is required by law to meet all demands for its services and, as with British Telecom, this means providing service even in unprofitable areas. The Company is also subject to a profit-controlling device known as the 'scheme of control' which allows for a permitted return equivalent to 16 per cent on shareholder's funds with the bulk of any surplus profits being placed in a development fund. In recent years, it has been approximately 90 per cent self-financing with net profits in 1980 amounting to HK$216 million.

International services – via high frequency radio circuits, submarine cables and satellites – are maintained by Cable and Wireless who, until recently, paid Hong Kong Telephone 15 per cent of the Hong Kong portion of international telephone revenues. From June 1980, after many fierce battles ending in intervention by the Government, this was increased to 40 per cent.

During the past two years, international telephone calls have increased by an average of 41 per cent a year with international direct dialling (IDD) increasing by 100 per cent a year. IDD is available to more than 80 countries and currently, nearly 70 per cent of all international calls are dialled direct. Operator-controlled calls are handled at the international call centre using modern cordless switchboards. Call charging for both IDD and operator-controlled international calls is automatic and bills are prepared by computer from information collected while the call is established.

Two features of the Territory – its geography and population distribution – have posed particular problems for the Hong Kong Telephone Company. High population densities have meant building large exchanges which will eventually accommodate as many as 100,000 subscriber lines while, in contrast to the crowded urban areas, there has been the problem of serving the sparsely-populated remote areas.

Intense activity over the past three years, however, has given previously isolated communities the same standard of telephone service as their city neighbours. Customers in these remote areas enjoy full exclusive service, with party line working being almost unknown in Hong Kong and used only as a short-term expedient.

Despite record demands for basic services last year, the Company strives to meet service on demand – on average within seven working days. But the large number of people moving into new towns and other redevelopments, and an excep-

tionally large increase in demand from squatter areas on dry land and from the floating sampans, has meant that over the past year this has not always been possible.

There is no charge for calls within Hong Kong, the telephone system being operated on a flat rate basis with subscribers paying only a £40 (HK$450) connection charge and a monthly residential rental of £3.28p (HK$37) or a monthly business rental of £4.41 (HK$55).

An unusual setting for the telephone – a Chinese temple in Hong Kong.

Visitors to Hong Kong are delighted by the 'free telephone calls' facility, and most trading establishments usually have a telephone available to customers as 'part of the service'. But, a 'flat rate tariff' is not without its problems and the booming local economy generally and particularly stock and gold market activities have recently created some network congestion at popular times of the day. To cope with the increasing amount of administration work, the Company has implemented an ambitious programme of computerisation involving section forecasting, traffic recording, budgeting, payroll, billing, stores and other clerical-based functions.

A fully-computerised sales office system is being introduced and is capable of generating telephone numbers, cable circuits and equipment allocation and directory entry and billing arrangements from a single input via a video terminal.

Directory enquiry work is concentrated at a single 120-position DQ centre and is yet another area which has been computerised, a trial scheme having started as long ago as 1974. The system became fully operational in 1977 and now uses dedicated mini-computers. Information retrieval is almost instantaneous and new numbers are entered into the system 24 hours before they are connected. Some 100,000 calls per day are handled by the centre of which only two per cent of enquiries are for residential numbers.

The Company publishes four telephone directories – a Territory-wide 'Business Numbers' directory and three area residential directories. The 'Business Numbers' publication includes a classified yellow pages section. English and Chinese versions are produced and subscribers collect their directories, using a coupon printed in the old directory, from special collection centres. Telephone directory production has become the largest printing operation in Hong Kong.

Viewdata, the telephone access visual information service pioneered by British Telecom, began its development phase in September 1980 and will, along with other types of data transmission, generate an increasing, yet still numerically small, percentage of non-voice traffic over the Territory's public switched telephone network.

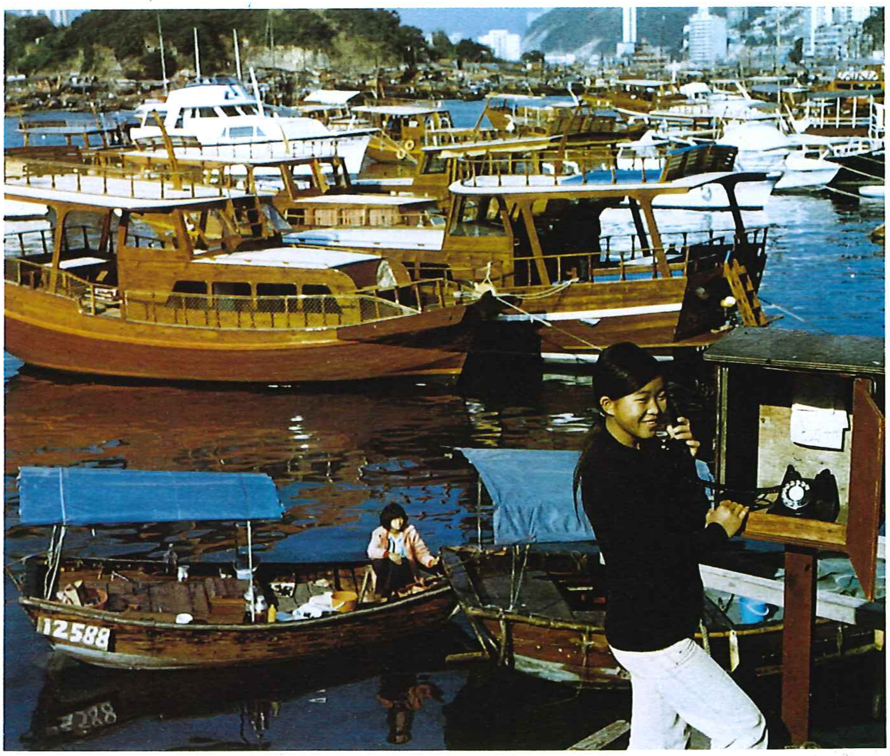
Data transmission services supplied by the company range from point-to-point circuits to an entire private network comprising circuits, modems and data control panels backed by a 24-hour maintenance service. A consultancy service is available for potential customers. The Hong Kong Telephone Company provides and maintains teleprinter facilities to suit the requirements of a wide range of users and provides the leased circuits over which Cable and Wireless operates the telex service.

An automatic radiopaging service, introduced in 1979, is proving popular, and is competing with some 14 other companies offering manual services. Its introduction presented problems in that although Hong Kong is geographically small, much of its area is uninhabitable owing to the many steep-sided mountains. This problem is exacerbated by the proliferation of high-rise buildings – 32 storeys on average – and required the installation of no fewer than 16 transmitters to ensure adequate paging coverage. A mobile radio telephone service, for use in cars and pleasure craft, is currently being considered and a recent study shows that despite the geographical problems, such a service would be economically viable.

Other facilities include a tropical cyclone and heavy rain warning service, provided for customers who need early advice of adverse weather, and a ship's telephone service which enables calls to be made into the public switched network within minutes of a ship berthing or mooring in the harbour.

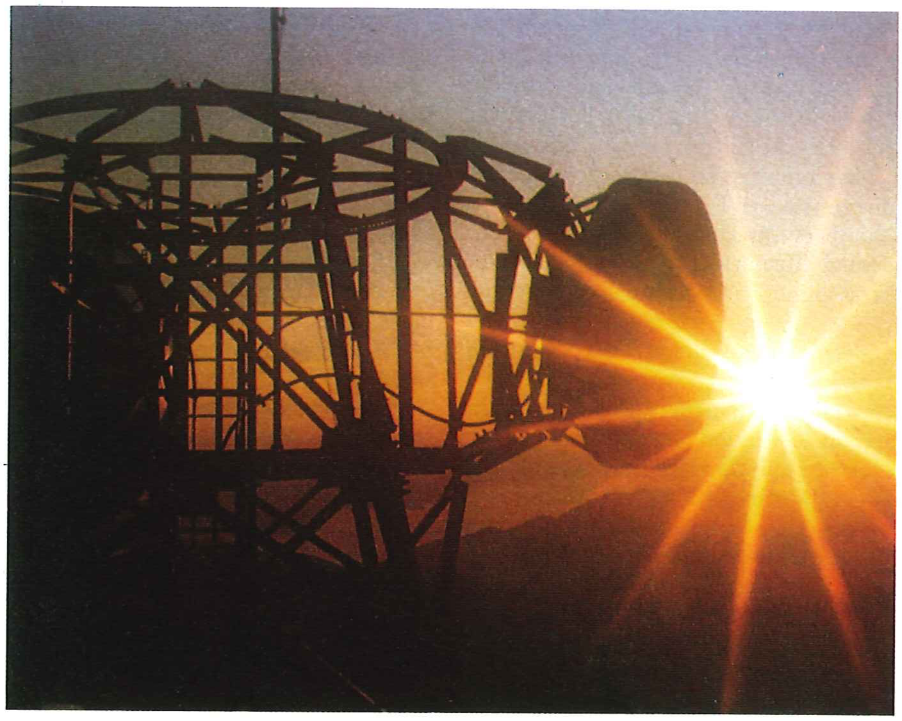
The time and temperature service, first introduced to Hong Kong Island last year, has recently been extended to give network-wide access. The Audichron System chosen for this service is similar to those used in the United States, and

The telephone is everywhere – here one of the Territory's fisherfolk uses a waterside line.



since the billing structure in Hong Kong is on a flat rate basis, the company has plans to use commercial sponsors as a source of revenue. The service is available in both Cantonese and English.

Subscribers' instruments provided by the Company consist of a wide range of rented domestic and business standard and push-button telephones. The company is currently introducing an extended range of premium telephone equipment, including a variety of push-button instruments, autodiallers and hands-free units. Northern Telecom's 'Contempra' and Siemens 'Masterset' are currently offered as a premium instrument and a decadic push-button telephone has been available for renting for some years. A field trial of standardised plug and socket connections is nearing completion in the hope that it will lead ultimately to the 'sale' of telephones through 'phone marts', with customers selecting and connecting their instruments to pre-wired outlets in their homes.



Hong Kong's line and junction networks are provided by a combination of cable and microwave circuits.

Here a computer is being used to provide telecommunications growth forecasts for Hong Kong.

Surprisingly, the Company has only recently entered the PABX rental market having previously been content to provide the multi-station keyphone type of installation. The Rolm PABX has, however, now been adopted as a standard Company product which, together with the Keyline (ECIS) equipment, meets the needs of small and medium size businesses.

To cope with the demand for new and existing services, transmission facilities are being upgraded. Two optical fibre systems were installed last May and are now in operation, the first step in a network which will, in about three years, be one of the largest in the world. Earlier in the year, the first contract for digital exchange equipment was awarded, and digital switching techniques are now being incorporated into the Hong Kong network, pulse code modulation having been in use for many years.

The Company is Hong Kong's largest single employer in the private sector and has some 12,000 local staff – an increase of 10 per cent over 1980 and a reflection of the ever-increasing workload. There are no formal unions as such but six joint staff consultative committees meet regularly and are a useful means of communication between staff and management.

Without doubt, Hong Kong, with its unique position as a seaport through which Chinese imports and exports pass to trade with the rest of the world, is a major centre and communications hub of the Far East. That being the case, the Company seems set fair to chart a continuing voyage of success.

The authors – **Mr P. H. Dabbs, Mr J. J. E. Swaffield, Mr J. F. L. Stubbs** and **Ms C. M. C. Aust** – are members of the international comparisons group in the Service and Performance Department of BTHQ.

They acknowledge the help of **Mr V. E. Smith** and **Mr R. Gadd** of the Hong Kong Telephone Company Ltd.

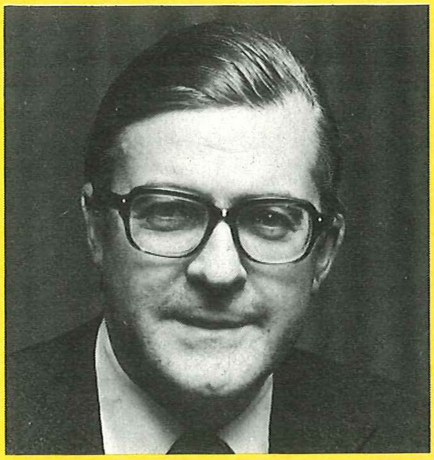
This is it

Information Technology Year 1982 has been launched by the Government to promote a wider appreciation of the opportunities, benefits and challenges provided by Information Technology to all sectors of the community. This article by **Dr P J Bury** of Business Systems Department looks at the central role British Telecom will play in the exciting developments which lay ahead.

Information Technology (IT) is a useful, catch-all term which covers the use of computers, microelectronics and telecommunications to produce, store, obtain and send information in pictures, words or numbers reliably, quickly and economically. It is a fast developing field where simple definitions are not always very easy to apply to particular cases: after all it could be said that a pencil was as much a part of IT as System X. And, thinking along the same lines, how would digital watches be classed?

But at its core, IT is crucially concerned with computing and telecommunications, and British Telecom, with its leading role in UK telecommunications, is very much in the thick of development in Britain. IT embraces devices for storing text, such as microfilm, and computer filing systems; systems for transmitting information, from the simple voice tele-

Message from the Minister



Minister for Information Technology Mr Kenneth Baker.

Exploiting new technology, redeploying resources, improving management and gaining a competitive edge in world markets are all tasks for the people who work in industry. Achieving them can be accomplished only by painstaking work in factories and offices up and down the country.

The proper role for Government is getting the framework right, getting the balance of the economy right and acting as a catalyst for change. And designation of 1982 as Information Technology Year illustrates the point.

IT is beginning to have a dramatic effect on every aspect of our lives. To many it symbolises merely the electronic office, but there is much more to it than that. In manufacturing industry, IT is invading the fields of design, production, storage and handling, and quality control, and it embraces allied technologies such as computer-aided design and robotics.

IT means telephones for the deaf, reading devices for the blind, personal computers, paperless offices, interactive television for the home, electronic mail, electronic newspapers, a digital communications network, satellite links, remote shopping, computer-aided learning, electronic fund transfer, and above all, instant access to virtually limitless amounts of information.

Already, IT is the fastest-developing area of industrial and business activity in the western world. Its potential as a job and wealth creator is enormous and the industries which develop its products and provide its services will clearly remain the principal source of economic growth in to the next century. One estimate suggests a world market for IT Products of more than £400 million *a day* by 1990.

The Government is seeking to build commitment and enthusiasm for the new technology and it is already active in many fields. For example, a 'Micros in Schools Scheme' is under way which should put a microcomputer in every secondary school in Britain by the end of 1982.

The British Telecommunications Act is creating a telecommunications revolution in the UK, spurring both BT and new market entrants to develop the modern telecommunications networks and systems to provide for the new products and services of the information era. BT's own internal reorganisation and marketing strategies ensure that BT will be the major IT force in the country. Six mobile exhibition trailers featuring advanced office equipment – including the latest BT exchange systems – will travel the country throughout 1982 to bring this message to people everywhere.

The success with which Britain manufactures the products and provides and exploits the services of IT are crucial to our future economic prosperity. We cannot afford to be among the also rans in the IT stakes.

phone to facsimile machines, electronic mail and Confravision; and ways of handling and shaping information, like word processors. In one sense, of course, IT has always been British Telecom's business, but new developments in the field, particularly the rapid appearance of new techniques and items of equipment, offer tremendous opportunities for the Corporation to become involved in a range of new activities.

It is clear that IT is going to be a central feature of the 1980s. New products and services will appear with the potential to improve the efficiency of business and commerce and the provision of these new goods will at the same time become a growing business in its own right. Naturally, the Government is concerned that these opportunities for the UK are fully realised and British firms need to be encouraged to introduce IT into their operations if they are to remain competitive with the rest of the world. At the same time, the IT industry is one that needs to be fostered in Britain so that chances are not missed to share in the prosperity that these new manufacturing and service industries have the potential to provide.

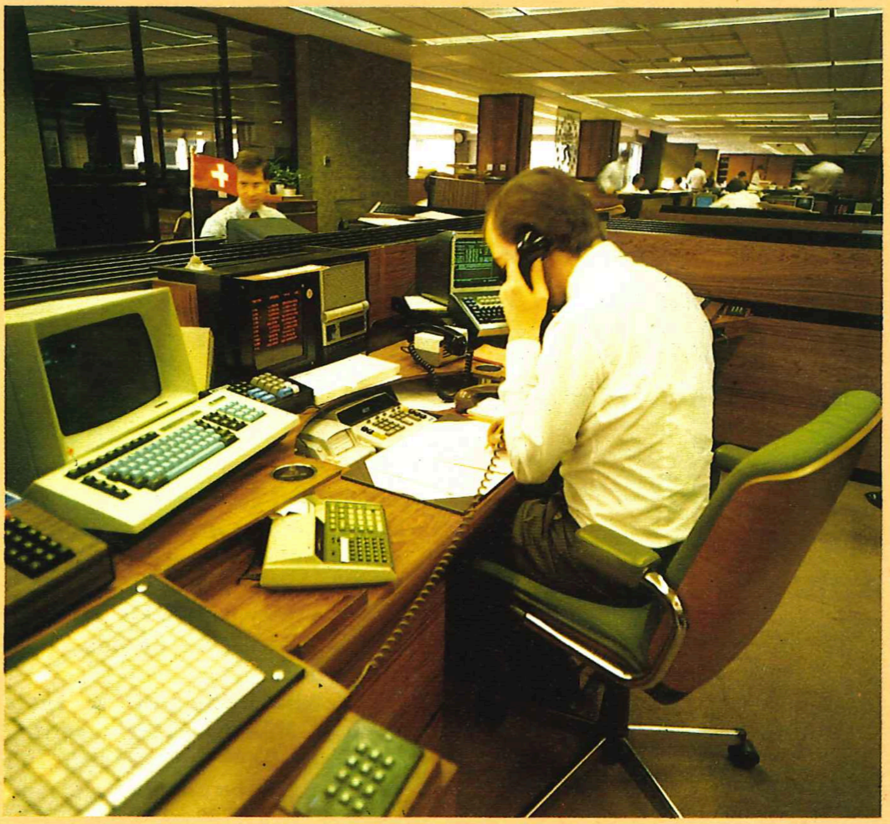
The national importance of IT has been marked by the Government with the appointment of Kenneth Baker as Minister for Information Technology, the nomination of 1982 as IT Year and a significant allocation of resources devoted to the embryo British IT industry and to encourage UK firms to make use of the technology. The task will be complex because even now there is considerable ignorance, even among businessmen, about what IT really is. There are also members of the public who do have some appreciation of the implications but often seen them in purely negative terms – "... one microchip can replace a thousand white collars", is a typical slogan.

Obviously in this environment, British Telecom holds a central position. The traditional role as monopoly provider of telecommunications services has meant that much of the nation's expertise in the IT field is concentrated in BT staff, and the networks and services that have traditionally been provided form the backbone of the communications systems on which new IT products will work. At the same time, British Telecom contains one of the most important centres of research and development into new IT products and services for the future, and will continue to play a leading role in representing Britain's telecommunications interests on standard-setting organisations, particularly in Europe.

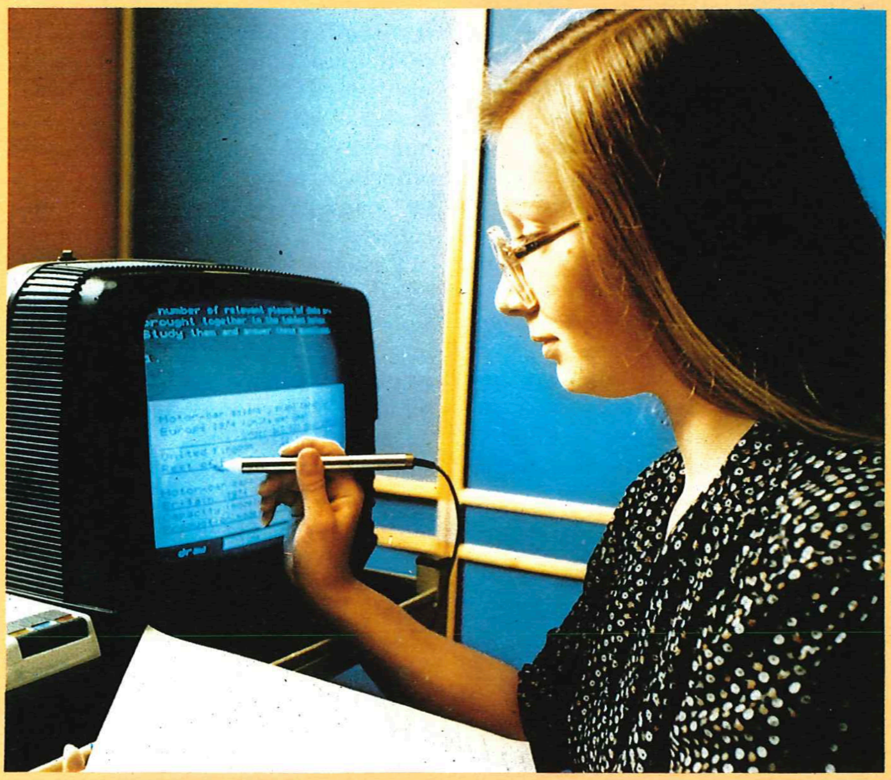
New ideas in IT are being created so

Right: British Telecom's Prestel system uses the telephone line to link the television to a computer data bank to provide a wide range of information for business and the home.

Information Technology plays a vital part in international financial dealings.



Another example of information Technology in action is telewriting. This enables users to 'write' electronically via the phone. British Telecom is currently sponsoring a trial of the Cyclops telewriting system invented by the Open University.

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frequently that it is often difficult to keep abreast of everything that is becoming possible. Most of these possibilities, however, depend on the telecommunications network to realise their full potential, and it is in the vital task of providing basic network service that British Telecom is making its most important contribution to IT.

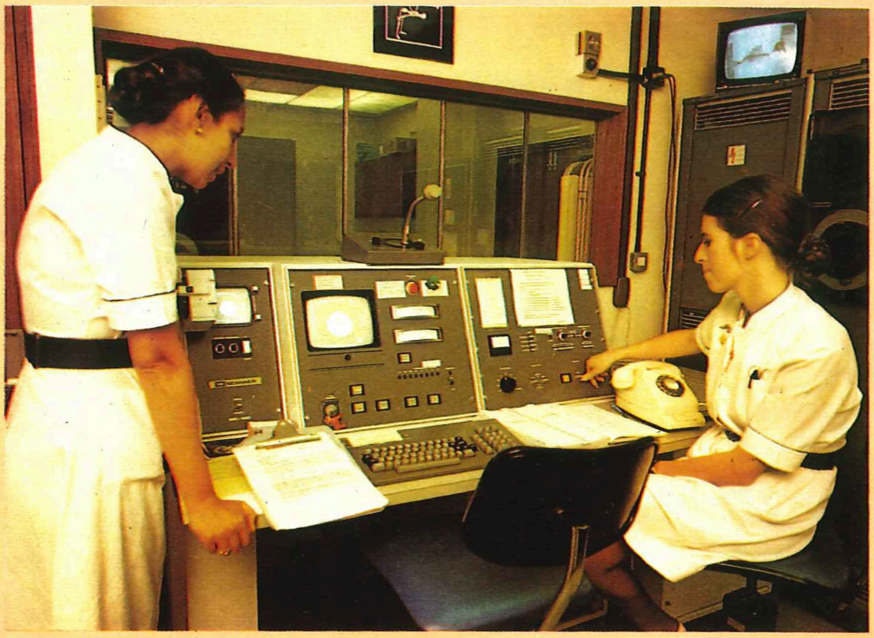
Many of the IT devices which are changing the way in which offices are run – viewdata, facsimile and electronic mail, for instance – use the simple public switched telephone network (PSTN) to communicate with each other. As long as British Telecom maintains and improves the basic PSTN service, much of the momentum of IT's introduction will be preserved.

But it remains important not to allow the ultra-modern glamour of System X and fibre optics to obscure the fact that a high-quality PSTN service, without the need for digital or high-speed transmission, is the vital resource which British Telecom is providing to help the IT revolution develop. The success of the campaign towards improving the quality of service in existing networks will have a direct bearing on the extent to which IT is taken up in Britain.

The mass market IT products such as simple electronic mailbox systems and viewdata terminals depends simply on the straightforward, cheap and universally available PSTN connection, and British Telecom will continue to be the major supplier of such network connections in the UK for the foreseeable future. But alongside such mass-market IT applications are the exciting ones of video transmission which can only work with wideband cable or broadcast systems.

IT is often regarded as being basically concerned with text information, but there are many applications where vision is essential to the transmission of information. Cable television networks are growing in the UK, and British Telecom is closely involved, using its expertise in cable network management. For the future, vision-based information transmission systems will need new wideband networks and British Telecom is already planning, in the design of System X, common channel signalling exchanges to help the ultimate development which, of course, is a switched vision network.

Services like Confravision need wideband communication networks but British Telecom's main investment in wideband is designed to increase the range of services for conventional data transmission available to customers. The London Overlay Network was inaugurated in September last year as a network of wideband communications links to speed up service to private circuit customers and later this year to give customers digital circuits at up to 2 Mbit/s. Similar overlay networks are planned for other major centres in the next few years.



The body scanner used in hospitals and clinics has put British Information Technology in the forefront of medical science.

As well as providing the networks themselves, British Telecom is active as a major provider of value added network services. These are network services available to customers such as the Packet Switching Service, which gives data customers faster, more accurate and often cheaper transmission or other potential services in which subscribers can store and retrieve voice messages without the help of a human operator. Prestel, allowing subscribers to retrieve information through the network, is a typical value added service.

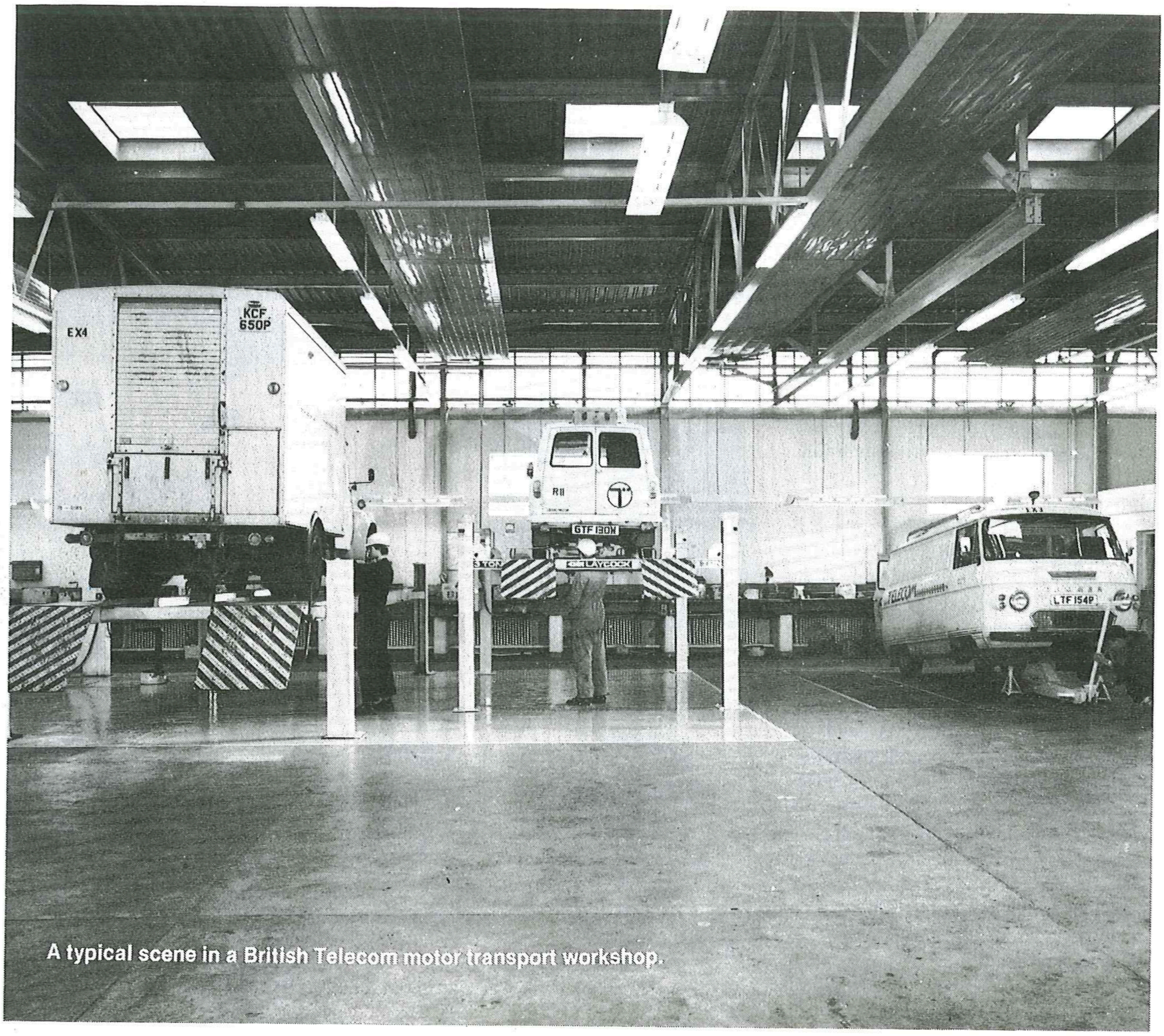
The hardware which is being produced to meet the requirements of IT derives from three traditional types – the computer, the PABX and office machines such as typewriters and photocopiers. British Telecom's role in supplying IT hardware is concentrated on the PABX and other telecommunications equipment. Advanced digital PABXs like Monarch, Herald and Regent are proving a great success in meeting the communication needs of customers, and a new range of microprocessor-controlled telex machines has also been successfully introduced.

But for most types of IT equipment British Telecom is not a supplier but rather a facilitator. The main element of British Telecom revenue is from use of its networks, and it is therefore keen to promote those IT services which increase use. Facsimile services and teletex are both being fostered by British Telecom through the setting of standards to ensure that individual machines are compatible with each other and by the publication of users' directories.

The role of British Telecom in Information Technology is in many ways no different from its familiar traditional role. IT depends to such a great extent on an adequate provision of networks that the ordinary business of British Telecom – providing network service – is also its greatest contribution to the development of IT. But the corporation is conscious of the enormous increase in demand – both for use of simple networks and for the value added services which can be supplied on them – which the growth of IT will create.

For this reason British Telecom will be an active participant in IT Year 1982, which aims to boost awareness, understanding and use of IT among the British people at large. The programme for IT Year began in November with a spectacular press conference at which the Minister for IT answered questions from journalists in centres round the country linked in via Confravision. During 1982 a series of events will be staged involving everyone from school children to senior managers in an attempt to spread the gospel of IT. British Telecom, deeply involved at the core of Information Technology, will be joining in the campaign with enthusiasm.

British Telecom Journal, Winter 1981/82



A typical scene in a British Telecom motor transport workshop.

Keeping vehicles on the move

M J Steele

With more than 50,000 vehicles, ranging from simple seven-hundredweight vans to 32 tonne articulated lorries, British Telecom operates the largest motor transport fleet in the country and possibly in Europe. This article looks at the varied range of equipment now installed in its 330 workshops throughout the country and how it is being used to make certain the wheels keep turning.

The cleaning, maintenance, and repair of British Telecom's vehicle fleet is a vital element in the new corporation's constant commitment to improve the quality of service to its customers. Much of the organisation's day-to-day business relies on an efficient transport system and it is the responsibility of the workshops to provide exactly that.

Vehicles entering workshops for major repair, inspection or the statutory Department of Transport annual test,

are thoroughly cleaned if required before work begins on them. Equipment used for cleaning includes pivot lifts, hot and cold high-pressure water cleaners and industrial vacuum cleaners. But because the pivot lift is a large permanent fixture, trials have begun using single-post column lifts operated both electrically and pneumatically. Occupying less space than the pivot lift, the mobility of the single post type results in much better use of the vehicle wash area.

Once cleaned, vehicles are transferred to the workshop for maintenance, annual test or inspection. To enable this work to be performed, lifts of three, eight or 14 tonnes equipped with wheel-free facility (portable beams incorporating hydraulic jacks) are used to give easy access to the underside of the vehicle. This enables quick checks and maintenance to be carried out. Special road wheel turning plates and equipment for checking component wear are also used in conjunction with the lifts.

Where major components need to be removed from the vehicle, a portable hydraulic crane or an overhead beam-mounted block and tackle is used for engine removal, while portable hydraulic transmission jacks are used for gearboxes and axles. If these heavy components need cleaning, they are taken to a special area on small platform stillage trucks. And when road wheels on large vehicles need removing, hydraulic trolley jacks, air impact wrenches and commercial wheel trolleys are used.

Oil changes for engines, gearboxes and rear axles are carried out using mobile oil drain units. When full, these are automatically emptied by plugging them into the air line system which transfers the oil under pressure to a large free-standing tank. Engine oil is renewed automatically by the use of air-operated oil dispensing units fed from a bulk storage tank.

New oil for gearboxes and axles is dispensed from hand-operated units while greasing of chassis lubrication points is achieved using mobile high-pressure grease guns. When all major work has been completed, the vehicle has its brakes tested on the roller brake tester and its headlamps aligned using the beamsetter. Front wheel alignment is set using special optical gauges. Because of the need to ensure the best possible fuel consumption, engines are tuned using exhaust gas analysers, tachometers and a variety of other special test equipment.

Turning to electrical systems, fault diagnosis is carried out with the help of 'Avometers'. Batteries are checked, and where necessary, quick-charged by mobile equipment or by fixed chargers which can deal with more than one battery at a time. Tyre replacements and repairs rely on a wide range of tyre changers and vulcanising equipment. Special safety guards are provided for heavy truck tyre inflation. Air compressors, lines and various pressure gauges are also widely used.

After a breakdown or accident, vehicles are recovered using a Towboy Unit. Once back in the workshop, Porto-power body repair kits and hydraulic presses are used to restore the vehicles. Drills and sanders operated electrically or by air are used by staff to carry out minor body repairs. Major work, such as wing or panel renewal is carried out using special air-operated cutting tools, oxyacetylene welding or electrical spot and argon arc

Brakes of a 7cwt van are checked using the roller brake tester.

The complete motor transport workshop toolkit on display.

welding equipment. Vehicles can then be painted, usually by brush or roller but, in large motor transport workshops, arrangements can be made to provide purpose-built spray booths. For new vehicles, special air-operated under-sealing guns are used to spray underbody protection fluids onto those parts prone to premature corrosion. Vehicles are washed automatically by machines operated by the driver.

Fuel for petrol-engined vehicles is dispensed either by electrically-operated pumps with manual recording or by self-service equipment with electro-mechanical or electronic recording equipment. Diesel-engined vehicles are supplied by electrically-operated pumps with fuel stored in bulk in tanks above or below ground.

All motor transport technicians maintaining British Telecom vehicles are issued with a comprehensive tool kit. Special tools are provided in all main workshops, and can be used by technicians when the job warrants them. New tools and parts used for replacement purposes are ordered from those manufacturers who can meet the necessary specifications at the most competitive prices. Every main motor transport workshop has a parts store, and equipment such as fire extinguishers, mirrors, fan belts, hoses and sparking plugs, are supplied on demand from Supplies Division in Birmingham to replenish stocks.

British Telecom's staffing and financial commitment to its Motor Transport Division reflects the importance given to running the business efficiently. Its vehicles are an essential tool of the trade for many engineers, and without tip-top maintenance, many of the corporation's activities would come to a standstill.

Automatic washing machines ensure that British Telecom vehicles are regularly cleaned.

Headlights on a 7cwt van are aligned using a beamsetter.

Mr M. J. Steele is carrying out head of group duties in the Energy, Transport and Accommodation Division of Network Executive and is responsible for the provision of major garage plant, tools and equipment.

British Telecom Journal, Winter 1981/82

★ Every year British Telecom's transport fleet travels more than 312 million miles and consumes 12.5 million gallons of petrol and 3.8 million gallons of DERV.

★ Nearly 7,000 new vehicles are acquired each year at a cost of about £34 million.

★ British Telecom's motor transport division employs more than 4,000 staff.

★ The average life of vehicles ranges from six years (small vans, estate cars) to up to 12 years for trucks of one tonne and above.

★ As well as more than 330 workshops throughout the country, there are two central repair depots at Yeading in west London and Lansfield near Wolverhampton.

★ Among the more unusual vehicular mechanical aids are 187 pole erection units, 307 rodding and light cabling vehicles, 251 mobile elevating platforms, 252 trench excavators, 36 gully emptiers, 42 mobile cranes, 29 road sweeping machines and 640 mobile automatic exchanges.

Line connector boost for t

A L Ripley

Brand new high-technology equipment, using the latest magnetic bubble storage techniques and designed to connect telex customers to their exchange, has been brought into service at two locations in British Telecom's London Region. A third is being commissioned at Coventry. Used to augment existing Strowger equipment, each of the new stored program control inland telex line connectors – ITLCs – provide additional capacity for up to 1,000 more customers at a telex exchange.

Manufactured by Plessey and known as the 4660/20, the ITLC is the smallest member of the Plessey 4660 family of systems. A larger version, the 4660/70, has been in service since October 1978 at St Botolph's House providing international telex gateway facilities. The first ITLC was installed at Fleet Street inland telex exchange and took over existing west London telex customers, freeing Strowger equipment for further growth in central London. The second unit is at Houndsditch telex exchange and this also caters for west London customers.

Because ITLCS are adaptable and quick to install, they have been used initially to provide service to overcome a temporary shortage of Strowger exchange connection points. But ultimately they are intended to fulfil an emergency role for speedy restoration of customer service following exchange failure.

Programmed to work with the existing Strowger telex network, the ITLC replaces customer calling equipment and time zone metering (fee determination and route barring) equipment as well as some group selectors and the appropriate customer final selector groups. It determines the correct fee rate to be charged on metered calls and supplies pulses to operate the customer meters. Customer lines are connected to line terminator cards and the interface with the Strowger telex system is provided by trunk terminator cards with up to 250 circuits per 1,000 customer lines.

A 1,000-line unit comprises five cabinets, each containing the cards for 256 terminations. One cabinet, containing the common control equipment, is designated the 'master' while the remaining four act as 'slaves'. Because ITLCs are modular, they can be subdivided into multiples of 200 customer lines, 'slaves' being readily converted to 'master' by adding the common control cards.

One big advantage is that each ITLC occupies about a third the area of the Strowger equipment it replaces. ITLCs need no special environmental control arrangements because neither disc nor magnetic tape storage devices are used. They are powered by the exchange 50 and 80-volt supplies, and are connected with the remainder of the telex exchange and partner cabinets by plug-ended cables. This has been a great advantage as all the pre-cabling was completed before the equipment was delivered. Using direct labour it takes just two days to install a unit. Connected to each ITLC is a receive-only teleprinter (30A) for maintenance read out (MRO) and a teleprinter (15) used as a maintenance and supervisor terminal (MASR).

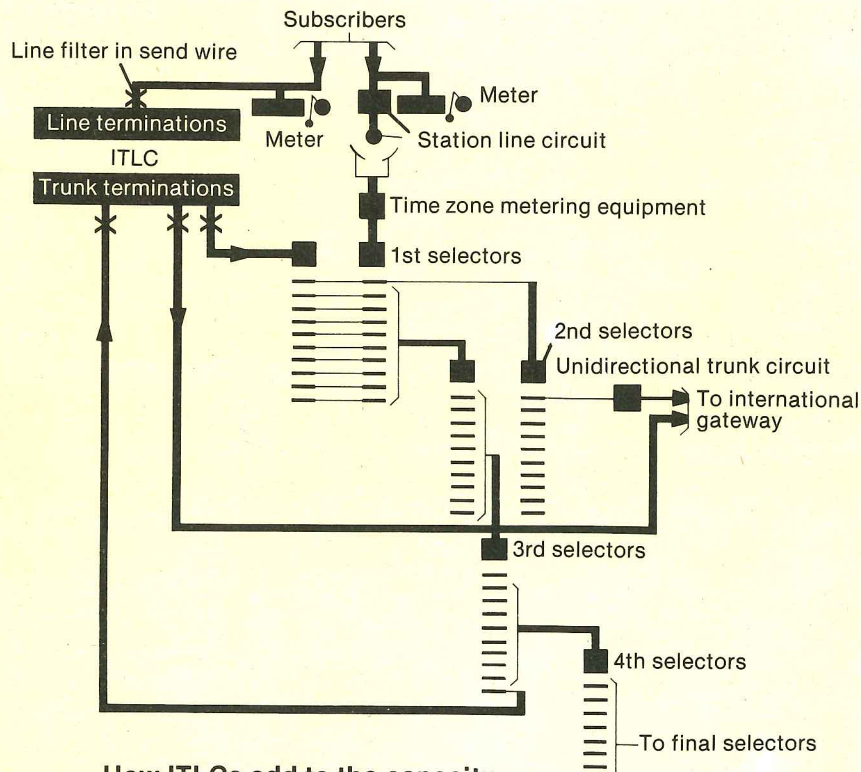
The diagram (below) shows how ITLCs add to the capacity of an existing telex exchange. They can provide the same facilities for customers as that provided on the Strowger network but unlike Strowger, the ITLC regenerates all signals passing through the unit and can remove any distortion. A continuous check is maintained on signals received on all terminations.

A printout highlights any signal distortion of more than 30 per cent. Calls coming into the unit are checked before being repeated out of the unit and where the international gateway exchange access code is dialled, the call is routed direct to the St Botolph's international stored program control (SPC) unit on a separate group of trunks. Customers on the same ITLC are recognised as such and are directly connected within the unit. The use of a call unit printout (CUP) has resulted in further equipment savings in the customer rented facility by printing the number of chargeable units on the customer's teleprinter.

At the heart of the ITLC are the General Automation microprocessors through which all signalling and data traffic passes. The system has been structured so that any hardware fault does not affect more than 16 lines.

Each cabinet has its logic and signalling power supplies derived from the exchange power unit and is controlled by equipment at different levels in performing basic functions associated with character transmission and signalling.

The microprocessors operate from stored programs held in the main memories where tables are used to con-



How ITLCs add to the capacity of a telex exchange

trol and allocate functions such as system number plans, and customer class of service. Special performance monitors provide the system clock timings and monitor the activity of each microprocessor and they are also responsible for the operation of the microprocessors and for transferring control from on-line to 'hot standby' in the event of a fault. This can be achieved without losing calls in progress and with a maximum of one character loss, does not affect the customer.

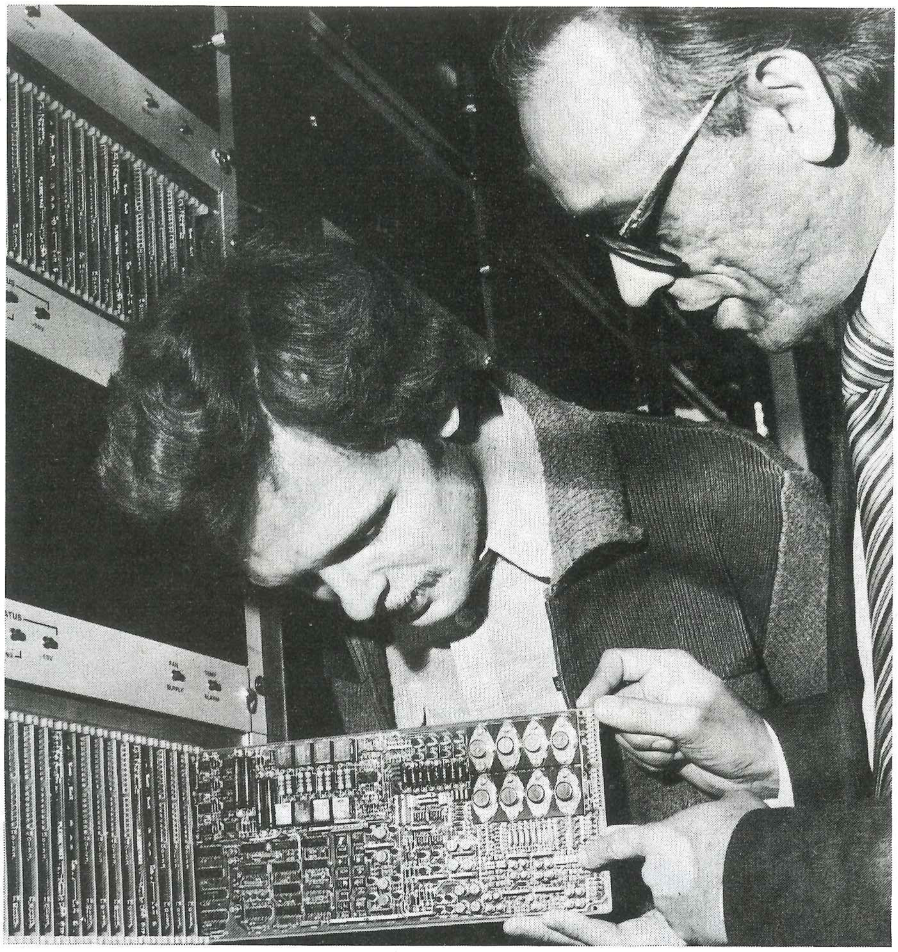
Main memories are of the random memory (RAM) type with a storage capacity of 1,024 Mbits. Auxiliary memories are provided as a back up to the main memories. The ITLCs have been supplied with a magnetic bubble auxiliary memory – the first time the bubble technique has been used on live traffic in British Telecom.

The device used is one of the standard Plessey PBM series multi-loop bubble memory configurations. The single card includes four magnetic bubble chips and the associated peripheral control logic gives a total available capacity of 1,049 Mbits. The microprocessor's control and main memory use parallel bit data transfer, while the bubble memory is organised for serial data transfer. Equipment known as the synchronous data link controller (SDLC) enables these two methods to work together.

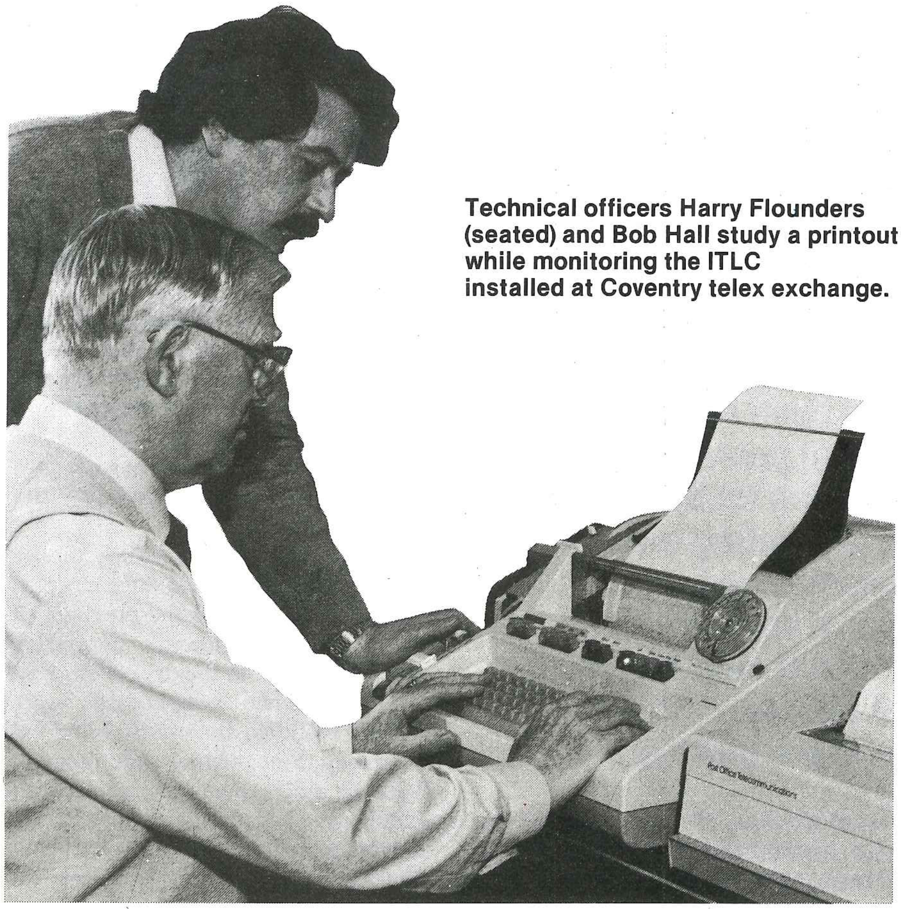
When working, a reconfiguration and maintenance (RCM) command can be used to compare the contents of the on-line bubble memory against its associated RAM. This is achieved by copying over the bubble contents, a block at a time, into a dedicated verification area of the RAM, successive blocks overwriting its predecessor. Any discrepancies between compared blocks are printed out. A further command allows the contents of the RAM to be copied across to the bubble.

The introduction of the inland telex line connectors ensures telex will continue to provide a dependable and expanding service set fair to take British Telecom into the age of information, technology and the electronic office.

Mr A. L. Ripley is a head of group in one of the Exchange Systems (non-voice) divisions of Network Executive and is responsible for telex planning.



Examining a card from an ITLC unit at one of London's inland telex exchanges are executive engineer Sandy Sandhu (right) and technical officer Dave Pascoe. Each card caters for four customers' lines.



Technical officers Harry Flounders (seated) and Bob Hall study a printout while monitoring the ITLC installed at Coventry telex exchange.

ABLE TO WORK

I Orbell

Eight years ago, engineer Mick Lade lost his right arm in a diving accident. But his determination won through, and he is working again, helped through retraining provided by British Telecom.

The slogan 'the right to work' has been adopted in recent years by a growing lobby representing the unemployed. But it applies just as much to another group of people . . . those who are disabled.

For more than 60 years British Telecom has played a positive role in helping to meet the special needs of disabled people. Inclusion in the Manpower Services Commission's select list of 'Fit for Work' award winners last year – the International Year of Disabled People (IYDP) – was recognition of the positive and constructive policy shown by the Corporation.

Although the awards were specifically for organisations who had done most for disabled people during the previous 12 months, British Telecom's impressive record dates back to the days of the first world war when switchboards were specially modified for use by blind ex-servicemen. Since then a wide range of telephone aids – many using advanced technology – have been developed.

Examples include Braille card call-makers, speech amplifiers, handsets with flashing lights to indicate incoming calls and 'tactile' switchboards for blind telephonists. Work is also continuing in developing communication for the deaf through the Prestel viewdata system and a film – *Desire to work* – has been produced to illustrate such aids publicising their many and varied applications.

For the disabled employee, this sort of aid is vital because a few simple adjustments or alterations can make all the difference. 'Integration into the community' has been the message from the IYDP.

In the past, disabled people have been excluded from many areas of life others take for granted: they were considered 'disabled' rather than 'people' and as such were very often thought of as a race apart.

But 'disability' covers a wide range of conditions, most of them neither severe nor permanent. According to the Manpower Services Commission, fewer than one per cent of disabled people in Britain are confined to wheelchairs. One of the most common causes of disability is heart disease, a condition which in many cases does not prevent an employee's eventual return to his former duties.

The IYDP has, of course, successfully captured the imagination of many individuals and groups and drawn attention to the moral as well as statutory responsibilities society has towards disabled people. It is hoped that the Year will also become the basis for future action and that the disabled will not become a forgotten minority.

One of the biggest contributions made by British Telecom has been the establishment of regional disablement liaison officers (RDLOs). There will soon be one in each regional office who will usually be based in the personnel or welfare department. They will back up much of the work already being achieved at local offices and within this context, their role can be defined in four ways. These are:

★ To be a contact and advice point on employing disabled people;

★ To be aware of changing legal, social and other circumstances which have implications for the employment of the disabled;

★ To ensure British Telecom policy on this matter is understood by all staff;

★ To liaise at regional level between the personnel, welfare and occupational health service departments, all of whom have a close interest.

So an important part of the RDLO's work is to back up local management commitment to the policy of 'integration'. Encouraging a fuller understanding not only needs but positively invites participation by all sections of the workforce. Employers' and employees' goodwill is essential and the 'Fit For Work' scheme with its support from government, CBI, TUC, and organisations for the disabled reflect this and set an example to all sides of industry.

This united approach has been given full support by unions and management, and a policy statement on the employment of the disabled was published early in 1981.

This set out four main guidelines:

★ Recruitment staff should maintain regular contact with local disablement resettlement officers (DROs);

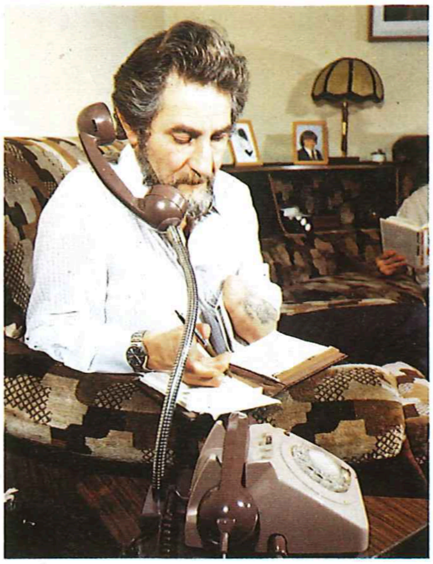
★ Full advantage should be taken of available Government schemes to aid the employment of the disabled;

★ Recruitment staff are empowered to discriminate positively in favour of registered disabled applicants;

★ If an employee becomes disabled while working for British Telecom, every effort will be made to ensure his continued employment, if necessary, by providing alternative work or light duties. Suitable training or rehabilitation will be arranged if it is thought to be appropriate.

Local DROs can give valuable information on all aspects of the disabled in employment including the many Government-sponsored schemes. These help cushion the expense to industry in meeting such obligations and are probably under-used by many employers. There is a capital grants scheme to finance modification of premises or equipment which is essential before a disabled worker can take up employment with that employer. There is also a job introduction scheme subsidising a six-week trial of a disabled ▶

The stalk telephone is just one of the many aids provided for disabled people, and can help provide independence, participation and equality. Roy Peters, badly injured by a hand grenade explosion, has beaten all the odds to build up a career as an account clerk.



Many disabled people are employed by British Telecom in area renovation centres. Here, at Camberwell in South London, technician Fred Griffiths, handicapped as a result of a motoring accident, refurbishes another telephone.

A diving accident left technician Boyd Pearson of Brighton paralysed from the shoulders down. Three years later, Boyd was back with British Telecom operating an electronic filing system for the external works control group in Brighton telephone area. And in January, sponsored by British Telecom, he began a special computer course for the disabled at Leatherhead in Surrey.

person in a job where the employer has doubts about his suitability, and a loan arrangement which provides disabled employees with specially-made tools or equipment to help them in their jobs. All these can help overcome many of the immediate problems which are faced by employers.

An example of the sort of specialised equipment now opening up the field of employment is the Optacon (optical to tactile converter). This uses a camera to scan print, and then, by a system of rods vibrating in the forms of individual letters, allows most reading matter, from simple papers to complex technical documents, to be read by the blind. No longer are they restricted to written matter which is only produced in the Braille format.

More recently, employment, or perhaps more accurately, unemployment, has been a problem for both able-bodied and disabled workers. But it should be remembered that disabled workers generally suffer unemployment rates several times higher than the rest of the population. With these developments have come moves to replace the statutory quota system. This was set up under the 1944 Disabled Persons (Employment) Act and stipulated that all employers with 20 or more staff must employ at least three per cent registered disabled people (RDPs).

Originally conceived as a protective measure, protecting from discrimination an identifiable group of workers with special employment problems, the quota system has remained virtually unchanged since its inception. But over the years, many factors have overtaken it, making the system increasingly impractical. The Act was introduced at a time when there were many physically disabled ex-servicemen. Now there are no longer three per cent registered disabled people in the working population, it has become mathematically impossible for *all* employers to comply with the quota. And as it applies only to the *registered* disabled, problems in encouraging disabled workers to register in the first place, have undermined the purpose of the quota.

Many employers like British Telecom could reach the three per cent goal if they counted both their registered and unregistered disabled employees. As the war disabled pass out of the employee age range, the decline in the percentage of RDPs in the working population will accelerate making the three per cent quota more difficult than ever to achieve.

Despite all this, the possible replacement of the quota by fresh legislation linked to a code of practice could lead to less enlightened employers declining to make the necessary efforts on behalf of their disabled workers. While this will not happen in British Telecom, it will be up to all those involved, including the RDLO, to ensure that the standards set in the past are upheld to the fullest extent.

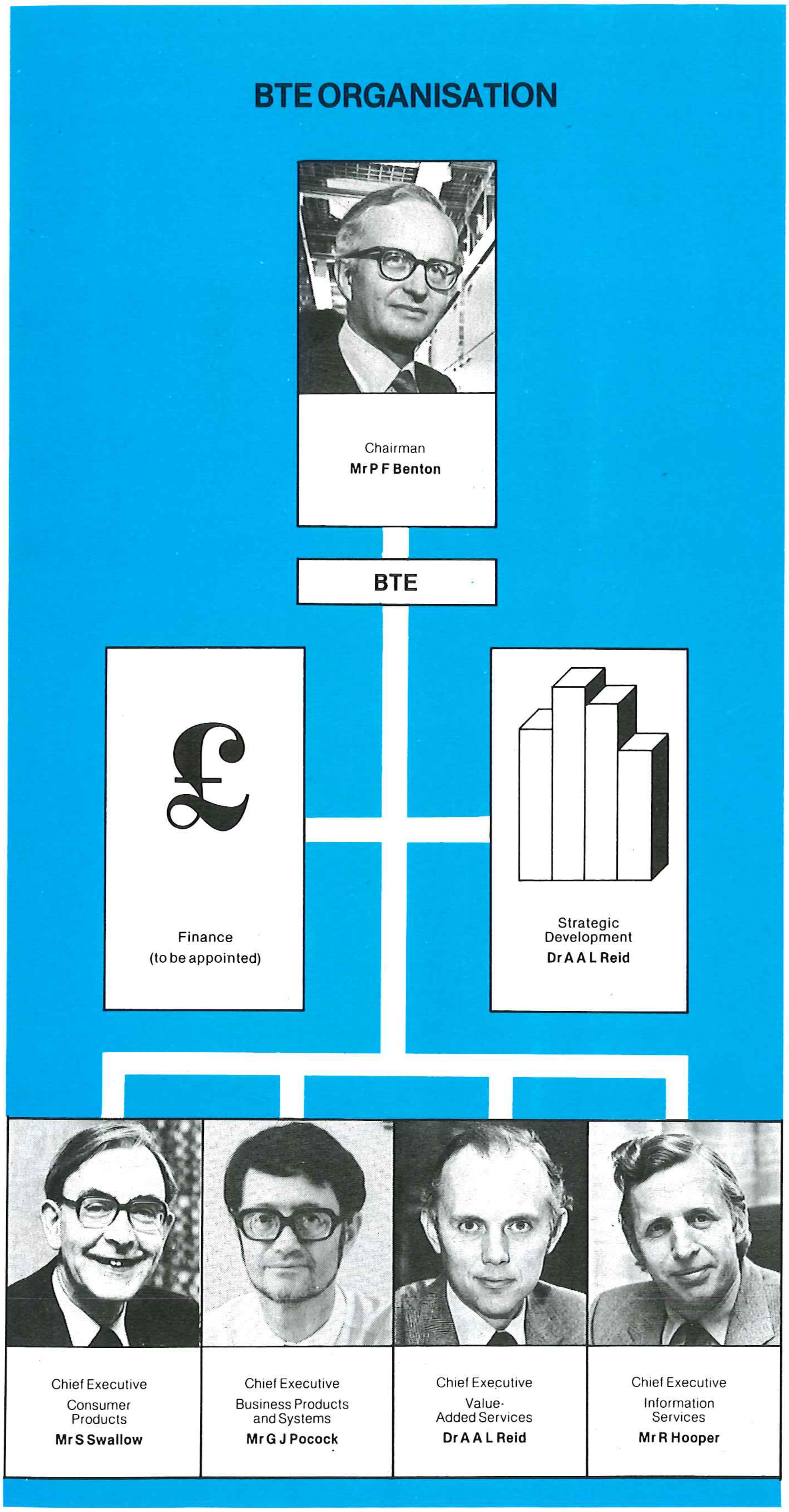
It can often make good business sense to employ a disabled person. Research has shown disabled employees to be characteristically efficient, productive and loyal, and as people who amply repay any efforts made on their behalf. Where employees who become disabled are retained, their existing experience and skills have obvious benefits. With the help of the RDLO, British Telecom ensures that personnel, welfare and occupational health service staff are kept in touch, and regularly examines promotion procedures in an attempt to ensure career prospects for disabled staff remain as open as possible. It is an area which has too often been neglected in the past.

It is worth echoing the Manpower Services Commission's reminder that threequarters of the disabled population in Britain were not born disabled but have become so by injury or illness later in life. It is the responsibility of everyone to ensure that 'disablement' does not become synonymous with 'unemployment'. The RDLO is well placed to play a leading part in the future, along with other caring people both inside and outside British Telecom.

Mr I. Orbell is an executive officer in the Personnel Division of SETR HQ and has been regional disablement liaison officer since September.

British Telecom Journal, Winter 1981/82

BT Enterprises - the key men



One of the major turning points for British Telecom in 1981 was the announcement by Chairman Sir George Jefferson and Deputy Chairman Peter Benton of the Board's intention to establish a new marketing arm – known as British Telecom Enterprises.

This new venture is being set up to help market new British Telecom products and services and develop many of the functions previously carried out by both the Marketing and Procurement Executives. British Telecom Enterprises is to be run on business lines, and is to be divided into four areas of activity, with each being financially accountable for its actions.

The four business areas will each be headed by a Chief Executive and are:

- Consumer Products – responsible for selecting, purchasing and supplying, on a wholesale basis, simple terminals aimed at the consumer market through Telecom areas and other outlets such as telephone shops.
- Business Products and Systems – responsible for selecting, purchasing and selling more complex products and systems. This unit will also look after arrangements for installation and maintenance of equipment.
- Value-Added Services – which will run all aspects of a range of competitive services, including network services, radiophone and radiopaging.
- Information Services – responsible for running both Prestel and Yellow Pages.

Chairman of British Telecom Enterprises is Mr Peter Benton and each of the Chief Executives – Mr Sam Swallow, Mr Gordon Pocock, Dr Alex Reid and Mr Richard Hooper – report directly to Mr Benton. The new organisation has a small corporate staff, including a finance officer and a unit headed by Dr Reid responsible for developing forward strategy and guiding future development of products and services.

Although some details still have to be finalised, those parts of Marketing Executive which had not been directly concerned in competitive activities such as those involved in monopoly and operator services, have been transferred to Inland Division.

Tower spectacular

Residents and visitors were treated to a novel high-rise spectacular in London's West End recently when one of the country's largest cranes – nearly 500 feet tall – was used to hoist eight new dish radio aerials to the top of the 620-foot high Telecom Tower.

The new radio aerials are needed to cater for continuing growth in the number of calls carried in the network and to provide for new services in the future.

The first will begin operating in June to provide a new radio link to Birmingham. This will be Britain's first high-speed digital microwave radio beam carrying telephone speech in the form of computer language – on-off impulses, or binary digits (bits). The 11 GHz link will operate at 140 million bit/s, equivalent in capacity to nearly 2,000 simultaneous telephone calls.

The second dish will become operational this year and by June 1983, the two aerials will together be able to carry up to 10,000 telephone calls between London and Birmingham, all of them in digital form.

Digital transmission, as well as providing customers with clearer speech has the added advantage of enabling other services – television pictures, music, fascimile and computer data – to be sent together with speech over the same path. This will enable British Telecom to offer all of these services easily and quickly to business users.

The radio link will be operating in parallel with an optical fibre cable between London and Birmingham which will enter regular service at the same time. This link will eventually carry up to 4,800 telephone calls, transmitted as pulses of laser light along hair-thin glass strands.

The 500-foot crane, hired from a company based in the North-East, weighs a massive 266 tons. Its load of eight aerials – mounted in a rigid frame to maintain dimensional accuracy – weighed one and a half tons. Total cost of the lift to get the aerials up to the Tower's aerial galleries was about £15,000.

British Telecom Journal, Winter 1981/82

Prestel's training role

The potential of Prestel for use in training has been recognised since its inception and, following the introduction of the public service in September 1979, an increasing number of organisations have made use of the system to distribute information about training opportunities. Advice on matters ranging from nursery education for two-year-olds to post-graduate and adult education courses is now readily accessible while, more specifically, a number of colleges and training bodies use Prestel as a means of advertising their courses.

Some information providers have also experimented with the possibility of using Prestel as a teaching medium, taking advantage of its interactive facility – by which the user can input to the computer his answers to questions displayed on the screen – to test ability at a variety of subjects, such as mental arithmetic and spelling.

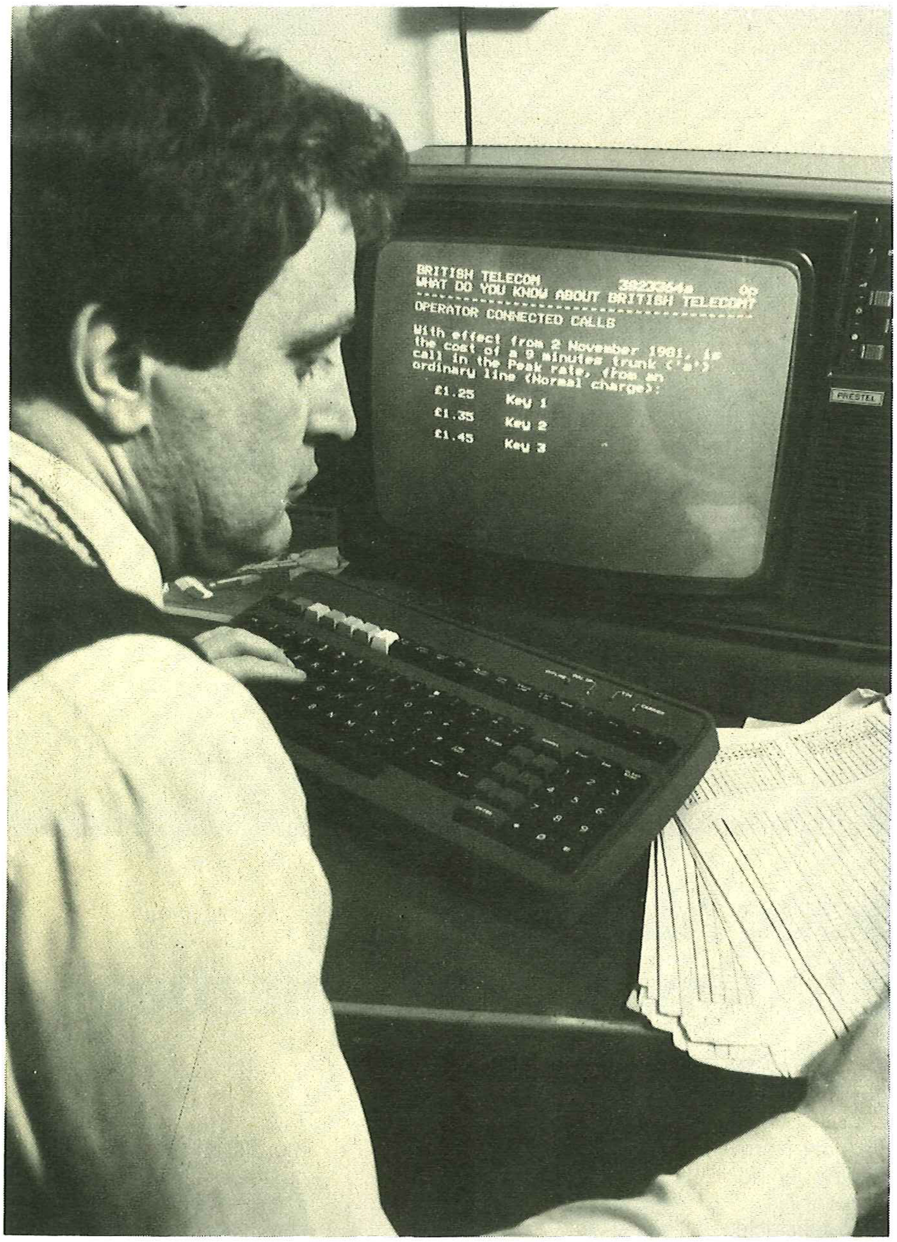
To assist in this development of Prestel as a training aid, a six-month trial of Prestel in operator services training is being undertaken in London and Midland Regions and North West and South West Boards at seven locations, comprising four automanual centres, one directory enquiry bureau and two telephone supervision training centres. At each trial location, the training supervisor using a Prestel terminal has access to a database which, in general terms, contains two different types of information.

First, a series of questions (and answers) related to the work of telephonists is available. These cover a variety of subjects – telephone charges, services, international comparisons and so on, and are designed for use in regular refresher training, supplementing the conventional group training material. A similar, but rather more demanding, series of problems for supervising staff is also included, so that supervisors can, on their own initiative, test their knowledge and ability to approach day-to-day problems in a logical manner. Among the topics included are a series on the subject of discipline, with case studies in late attendance, intemperance, and the recording of reprimands, and another on safety and accident reporting, produced by the safety training group at British Telecom Headquarters.

Prestel is used during refresher training for a group of telephonists at Brindley AMC in Birmingham.
Instructress is assistant supervisor Miss Betty Piercey.

The questions for both telephonists and supervisors follow a multiple choice format. Each question is followed by three possible answers, of which only one is correct, and associated to each of which is a number. The user keys the number of the answer which he believes to be correct and, in response, the computer displays a further page of information showing whether or not the answer was correct. It also gives further information about the subject and, for supervisor problems, refers the user to the appropriate Telecom Instruction to obtain fuller information on the subject. The object of these exercises is not to provide comprehensive teaching about a subject, but rather to encourage staff to think, and to stimulate lively discussion sessions.

The advantage of Prestel for this type of learning is that the material can be distributed quickly to a large number of centres, and can be subsequently replaced – for the sake of variety and topicality – by a further set of questions. Additionally, Prestel is easy to use, its coloured pages are attractive to look at and, because the computer is seen to respond to the user's answers, his interest is maintained.



Martin Flanagan, a telecom superintendent in the Personnel Services Department at British Telecom Headquarters inputs a page of training material into the computer.

The second type of information available to the training supervisor is a comprehensive list of the training information that is held in exchanges, together with the date of the most recent issue of the material and details of any instructions issued by the author for manuscript amendments to the material. Although radical revisions of telephonist courses are seldom made, a substantial quantity of training material is issued each year, frequently consisting of a revised programmed-learning text or amendments to one or two pages of the text. Additionally, when only a minor amendment to a page is required, which does not justify the reprinting of a page, instructions are sent to the exchange for the amendment to be made in manuscript form. The result is that exchanges are constantly required to ensure that their training material is up to date, replacing obsolete pages with amended ones and carrying out manuscript amendments as necessary.

Because of the amount of different material distributed, it is not always easy for exchanges to keep track of these various amendments. But with access to a comprehensive list of training material on Prestel, the training supervisor can readily check any material to ensure that it is fully up to date. Also included on Prestel are the 'brochures' for all courses available for telephonists and supervisors. These contain details of the objectives, syllabus, and duration of the course. In the event of changes being made to a course, the brochure information held on Prestel can be amended far more easily than the paper-stored brochures currently held in area training offices.

The information which forms the database is compiled and input to the Prestel editing computer by staff in the telephone operating and supervision training group at BTHQ who, for the purpose of the trial, have registered with Prestel as an information provider. Users at the trial locations are provided with a 14-inch colour information retrieval terminal, funded from the BTHQ computer-based training budget, and supplied as part of a contract for bulk provision of terminals to the Business as a whole.

Because the Prestel service operates on a 24-hour basis, both day shift and night staff have access to the terminal, and both are encouraged to make use of the database. Supervisors can guard against indiscriminate use of the terminal, however, by specifying a four-digit password which, having been input to the computer, must be used on all subsequent occasions that the terminal is used.

As well as providing a means of evaluating the potential of Prestel in operator services training, the results of the trial should help other training groups in British Telecom to establish any training benefits that they might obtain from Prestel. The trial may also be expected to stimulate staff outside the field of training, who may need to disseminate frequently updated material to a variety of widely dispersed locations, to consider Prestel as a viable solution to their requirements.

Mr K. W. Deacon is a senior telecom superintendent in the Personnel Services Department at BTHQ with special responsibility for Prestel training projects.

British Telecom Journal, Winter 1981/82

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PHICOM applied technology DATA COMMUNICATIONS DIVISION

MISCELLANY

Exchange orders

British Telecom orders worth £600 million are planned with three UK manufacturers over the next three years for 190 new TXE4A exchanges and 54 extensions to existing ones.

The three companies to benefit from the orders are Standard Telephones and Cables, Plessey, and GEC. These companies have already received orders for TXE4A exchanges worth £225 million. Developed by STC, the electronic TXE4A uses microchip technology. It can be developed to provide extra facilities in the future – including abbreviated dialling, repeat last call, reminder call, automatic call diversion and three-party service.

British Telecom already has almost 150 TXE4 exchanges in operation serving more than one million customers. With the TXE4A installations they will be the backbone of the local exchange network modernisation programme well into the 1980s, when System X, the all-electronic digital system will begin to take over.

The first TXE4A exchange was brought into service at Belgrave in Leicestershire last year. The first TXE4 came into operation in Birmingham in 1976.

Optical link underway

Work on laying the world's longest optical fibre cable from London to Birmingham has begun. The link will form part of Britain's growing optical fibre network and is due to come into service this summer.

At 201 km (125 miles), the London–Birmingham link will be 125 km longer than any previous optical fibre route. It will be the first in the UK to operate at a wavelength of 1.3 micrometres, and will be cheaper and more reliable by using light-emitting diodes (LEDs) instead of lasers at light sources.

The cable is being manufactured by BICC Telecommunication Cables while Plessey Telecommunication are supplying the associated electronic transmission equipment.

Contracts

Honeywell Control Systems Limited – £500,000 to control the energy consumption of 18 buildings in the Leicester Telephone Area from a single central location.

Marconi Communication Systems Limited – More than £3 million for KiloStream, a new digital data transmission system due to come into service this year. The contract follows earlier orders worth more than £5 million for the same system. The service aims to provide digital leased-line facilities to major UK business centres.

GEC Telecommunications Limited – Nearly £13 million for Ambassador telephones and the Ambassador plan version which is a small electronic switching system. The equipment is being manufactured at Aycliffe in County Durham and all deliveries are scheduled to be completed by July.

Marconi Communication Systems Limited – To provide British Telecom with fibre-optic local ends for its experimental business visual services network. The system comprises a combined transmitter and receiver operating over a pair of fibre-optic cables to provide two-way visual communications using standard 625-line monochrome video.

World first

Britain again leads the world – thanks to a new fully-computerised cargo system inaugurated by the Duke of Kent at Harmondsworth near Heathrow in December.

Called ACP80, it serves Heathrow and Gatwick airports and is claimed to be the world's most sophisticated airport system handling exports and imports.

Sir George Jefferson, Chairman of British Telecom, said the system saved time and money and that British Telecom was proud to be linked with such a worthwhile enterprise.

British Telecom brought the system into service through its commercial computing wing, the National Data Processing Service (NDPS). The system speeds and simplifies the clearance of imports through HM Customs and Excise and the despatch of exports.

Helping the world

British Telecom has begun helping underdeveloped third world countries bridge their communications technology gap. Its new Teletrade sales operation is supplying 'as new' equipment to overseas telecommunications administrations not yet ready for advanced digital communications. Already, British Telecom has notched up £1 million in sales to six countries – in only six months.

A wide range of equipment – from telephones to electro-mechanical exchange switching apparatus – is being offered by Teletrade. It varies from new, unused stock to equipment refurbished in British Telecom factories to the same high standard set for the UK network. Much of this equipment will have been recovered as a result of modernisation, and all prices are negotiated with prospective purchasers individually.

The maintenance of Strowger exchanges remains expensive in the UK, but in many foreign countries labour is cheaper and it often makes better economic sense to buy refurbished equipment as a money-saving stop-gap.

Senior appointments

Mr Clive Foxell is British Telecom's new senior director of development and procurement responsible for £1,000 million worth of orders placed by the business with industry each year. He will also oversee the development of System X.

Involved in early research on the transistor and other semiconductor devices, Mr Foxell joined the Post Office from GEC in 1975 as deputy director of research. He entered the Procurement Executive of the Post Office as deputy director of purchasing responsible for switching equipment and became director of purchasing in 1980.

Mr T Ashley Geipel has been appointed chief cost and budget accountant for British Telecom. This new post gives Mr Geipel the responsibility for the development and operation of costing and budgetary control systems throughout British Telecom.

A chartered accountant, Mr Geipel's previous position was as assistant chief accountant for ICI Europa, based in Brussels.

Ambassador arrives

A new-shape telephone, the first item in a range of modular telephone equipment, has been launched nationally by British Telecom.

Marketed under the 'family' name of Ambassador, it matches the new Herald and Monarch call-connect systems for the office and the Harmony loudspeaking unit. Its designers have broken with tradition by putting the handset on the left and the push buttons on the right.

The new telephones will be available in four colours – stone, dark brown, mid-grey and yellow.

Moving south

The automatic carphone service, which opened in London last year, has been extended to serve the Solent region. The service covers a wide stretch of country reaching from Poole in the west to Chichester in the east.

Solent area users can now make and receive calls from their cars by direct dialling in both directions and without the need to call the operator. The new service benefits 300 new customers in the region as well as existing London users when they take their cars to the south coast.

Top suggestion

The largest-ever payout by British Telecom's award scheme has been made to two Eastern Telecommunications Region engineers. David Atkins from Colchester and Tim Walker from Milton Keynes, have each received £3,000 for their exchange testing device which saves time and money.

The device, christened WAM – the Walker Atkins Multitester – automatically scans equipment in electronic exchanges. It produces a detailed print-out before a new exchange is brought into service and is now being used in exchanges throughout the country.

The two men came up with their award-winning idea while working at Leighton Buzzard exchange.

Prestel news

UK Prestel users now have access to further specialist business information, following the integration of the Prestel international service with that of the UK service.

This move was the result of international demand for access to data stored exclusively on UK computers and the imminent connection of viewdata systems via gateway – a facility enabling viewdata users to gain access to other national viewdata systems and also to a wide range of non-viewdata computers.

Prestel's computer centre in Boston – called Jefferson – has also opened, several weeks ahead of schedule. The centre consists of a dedicated viewdata computer that will be used to support marketing efforts in North America.

Prestel software is now being marketed worldwide by GEC CL with the full support of British Telecom. Seven of the 16 public videotex services or trials are supplied by GEC CL computers and British Telecom software. Prestel-compatible systems are now working in more than 20 countries.

Prestel's first national Teleshopping Week was held in November and enabled users to choose and buy goods and services offered by more than 40 companies. Aimed at demonstrating the value of Prestel to the consumer, national Teleshopping Week gave an opportunity for companies to publish details of a wide range of goods, from office equipment and books through to videotapes, jewellery and airline seats.

This winter has brought more than its fair share of misery to the inhabitants of York but despite the snow and floods, engineers like technician Dave Morris have had to stem the tide of faults caused by the rising waters of the river Ouse.

Helped by the army, engineers worked round the clock dealing with vital repairs to cables and exchanges.

Comsat call for papers

The sixth international conference on digital satellite communications is to be held in Phoenix, Arizona between 19 and 23 September 1983. Hosts Comsat have now called for papers which cover a wide range of subjects including international, regional and domestic services, business services and teleconferencing via satellite, interfacing and interworking with terrestrial networks, and future developments in digital technology.

Abstracts for papers should be sent to Mr Howard Briley, c/o Comsat, 950 L'Enfant Plaza, SW, Washington DC, 20024 by 30 September this year.

Three more for IDD

Three countries – the Cameroons, Ethiopia and Uruguay – have joined the international direct dialling (IDD) network. This means that 111 countries can now be dialled by almost all UK users.

More than 97 per cent of all international calls from the UK are directly-dialled, with more than 92 per cent of the world's telephones available on IDD.

Subscriptions and back numbers:
The price to staff at their point of work is 30p a copy.
To subscribe, please complete the form below. The life subscription for retired staff is £9.50.
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Contributions:
The Editorial Board will be glad to consider articles of general interest in the telecommunications field from all sources. No guarantee of publication can be given. The ideal length of such articles is between 1,000 and 1,500 words.
The views of the contributors are not necessarily those of the Board.

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ALPHABETICAL INDEX

GROUP INDEX


Who's storing the mind?
The security man prowls through the darkened building. Is the business asleep?
After midnight, when the lowest phone rates operate and the computer is under-employed, the SE Data Auto Caller establishes modem contact with the out-stations through a series of pre-programmed calls.
Daily reports, sales figures, stock movements are all fed to the computer by the automatically connected modem link. Before the shops or branches open next morning, a complete set of instructions, accurately based on the latest field information, is ready when people start work.
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TEST
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VOL.
* Off Hook
0-9 Dialling Digits
A End of Number
B Interdigit Pause
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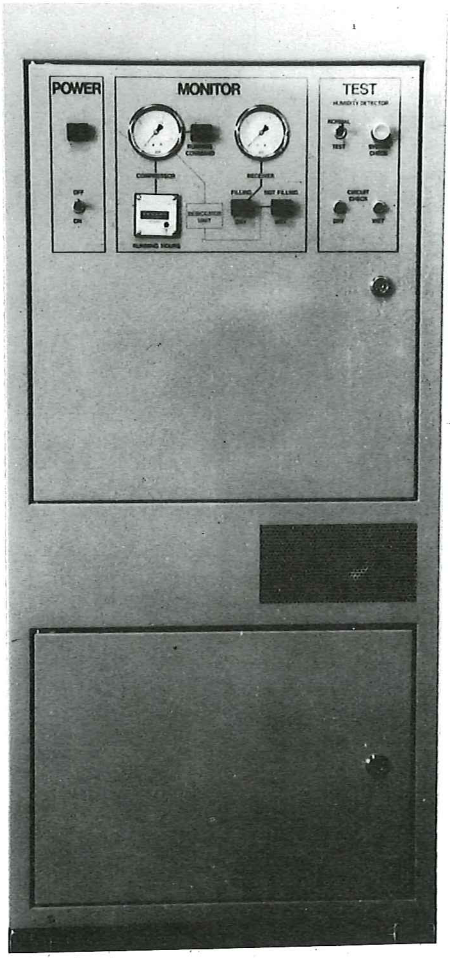

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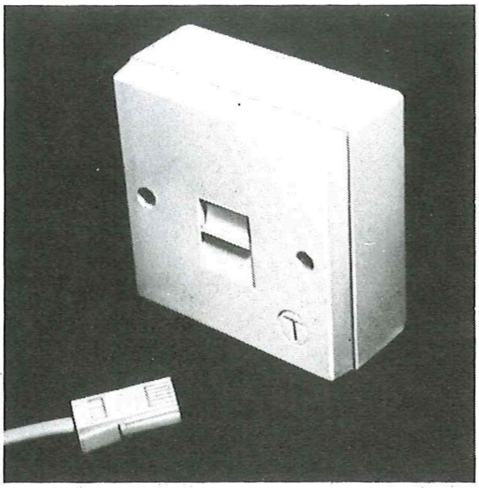

Line Jack Units

THE NEW BRITISH TELECOM PHONE SOCKETS

Line Jack Units incorporate the six-way jacks to accept the 4 and 6-way plug supplied with the latest style telephone cord.

Comprehensive range of units.

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Box Connection

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VERSATILE DISTRIBUTION SYSTEM

This is a completely new range of telephone connection boxes designed for and approved by British Telecom.

This flexible concept is based on modular principle and provides a most economical method of installation.

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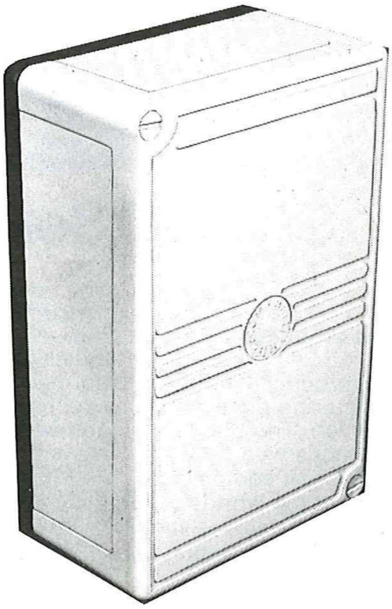
Boxes can be supplied complete with terminal strips, connectors and pre-wired harnesses in the particular wiring configuration to suit the system.



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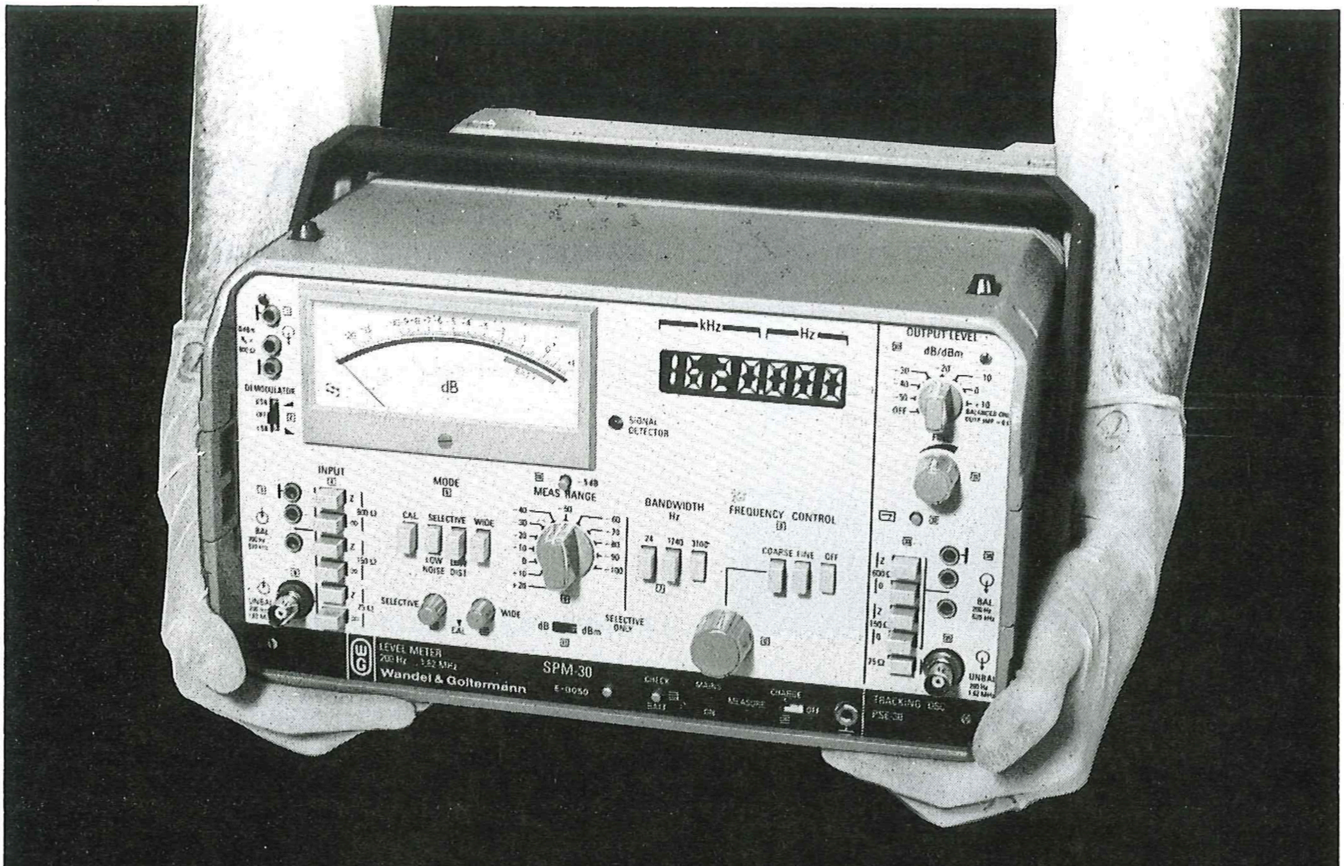
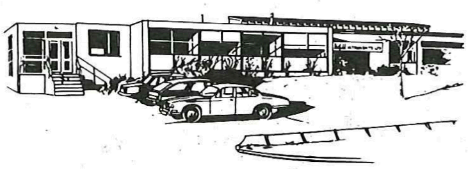


W&G Instruments Latest Offspring

SPM-30 Selective Level Meter

Developed and Produced in England
The SPM-30 is produced at the W & G manufacturing plant at Plymouth in Devon. The W & G logo is synonymous with high quality, precision test equipment known throughout the world for accuracy and reliability — the SPM-30 will follow this tradition.



The combined skills of W & G Instruments have developed a new, economically priced level meter with many features normally only found in more expensive sets. This selective and wideband level measuring set is designed for surveillance and maintenance of modern FDM systems.
Among the many features incorporated are semi-automatic calibration and a synthesised local oscillator for accuracy and stability of frequency control enabling 1 Hz resolution in tuning.

Sales & Services at Greenford, Middlesex
The W & G Instruments Sales and Service organisation is conveniently based at Greenford, Middlesex, affording quick access to the Motorway network and major airports.
This office handles the complete range of W & G instruments.

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Marconi MFT2 Microprocessor control of an entire HF station

Using the latest microprocessor technology, the Marconi MFT2 system enables one man to control and operate an entire HF station, including transmitters, receivers, antennas and ancillary equipment.

In combination with very fast frequency changing, the MFT2 system cuts running costs and increases efficiency.

Remote control is achieved by using low-speed modems. For single equipment systems only 110 baud modems are required.

The microprocessor basis gives immediate potential for adaptive control of total HF communication systems.

For details contact Gary Head, Radio and Line Division.

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